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WHAT DOES HEALTH REFORM MEAN FOR THE HEALTHCARE INDUSTRY?
EVIDENCE FROM THE MASSACHUSETTS SPECIAL SENATE ELECTION

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What Does Health Reform Mean for the Healthcare Industry? Evidence from the Massachusetts Special Senate Election

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ABSTRACT

The recent reform of the U.S. health care system has been described both as a boon and a death blow for the healthcare industry and for private insurers in particular. We exploit the surprise election of Republican Scott Brown to the U.S. Senate, which dealt a serious blow to the prospects for reform by depriving Democrats of their 60-vote “filibuster-proof” majority, to evaluate the market's assessment of Health Reform’s impact on the health care industry. We find that Scott Brown’s election was associated with an abnormal return of 2.2 percent for a typical dollar invested in health care stocks and an abnormal return of 6.3 percent for a typical dollar invested in managed care firms. A typical dollar invested in the pharmaceutical sector experienced abnormal returns of 2.9 percent, while investments in healthcare facilities (including hospitals) experienced abnormal losses of 3.4 percent. Analysis of firms participating in government programs show that firms involved with Medicare Advantage experienced gains while those involved with Medicaid Managed Care experienced losses due to the election.

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“This is the insurance company’s dream, this bill”¹

-- Howard Dean, former Chair, Democratic National Committee, December 16, 2009.

“The health bill creates a massive cash crunch and then bankruptcies for many insurers.”

-- Richard Epstein, University of Chicago, December 22, 2009.²

“If Scott Brown wins, it will kill the health bill.”

-- Rep. Barney Frank, January 15, 2010.³

“In a stunning blow to President Barack Obama, Republican Scott Brown won a bitter Senate race in Massachusetts on Tuesday and promised to be the deciding vote against his sweeping healthcare overhaul.”

-- Reuters, January 20, 2010.

I. Introduction

In March of 2010, Congress enacted and President Obama signed into law the Patient Protection and Affordable Care Act (PPACA), which fundamentally altered the U.S. healthcare system. The legislation, which was championed by the President and Congressional Democrats, expands health insurance coverage to many of the 46 million uninsured people living in the United States through provisions aimed at increasing the number of people receiving health insurance from both government programs and private firms. In particular, much of the bill is aimed at increasing participation in the private, non-group health insurance market. The plan is neither the single-payer system advocated by the far left, nor the deregulated, free-market approach advocated by the far right. As such, it has drawn energetic criticism from both sides.

Critics on the left have assailed PPACA’s approach to expanding insurance as inadequate, preferring the creation of a public insurance option akin to Medicare to the plan’s individual mandate, which requires individuals to purchase (sometimes-subsidized) insurance

¹ <http://abcnews.go.com/GMA/HealthCare/howard-dean-health-care-bill-bigger-bailout-insurance/story?id=9349392>. Such sentiments are not limited to the left. According to former House majority leader Dick Armey (R, Texas), “Only the most blinkered of partisans can look at the “individual mandate” and not see it as the answer to the health insurance industry’s prayers.” See <http://www.usnews.com/articles/opinion/2009/09/28/armey-individual-mandate-would-be-a-healthcare-industry-boondoggle.html>

² Richard A. Epstein, “Harry Reid Turns Insurance Into a Public Utility,” The Wall Street Journal, December 22, 2009, <http://online.wsj.com/article/SB10001424052748704304504574610040924143158.html>.

³ Montgomery, Lori. “Democrats push for compromise on health bill,” The Washington Post, January 16, 2010: A04.

from private firms. They further argue that these measures, which come at a time of increasing premiums and record-high profits, amount to a bribe to the insurance industry. Critics on the right, on the other hand, have responded to the provisions of the bill requiring insurers to cover even those with expensive, pre-existing conditions at the same rates charged to healthy people without a strong enough mandate requiring everyone to purchase insurance by noting that, under these conditions, healthy people will rationally decline to purchase insurance unless or until they become sick. This, they argue, would make it impossible for private insurers to compete and quickly drive them out of business.

As a more basic level, PPACA is an extremely complex piece of legislation with some provisions that can be expected to benefit healthcare firms and others that can be expected to harm them.⁴ With regard to the insurance industry, the bill requires most U.S. citizens to have health insurance, either through purchasing private insurance or through a government program, or else pay a penalty. Employers with more than 50 employees are required to contribute toward their employees' health insurance or face a fine. Health insurance exchanges will be created to help facilitate the purchase of health insurance, and poor people participating in the exchanges will receive subsidies. These provisions, which increase the number of privately insured individuals in the country, might be expected to benefit insurers. On the other hand, the law restricts insurers' ability to place lifetime or annual limits on benefits, to rescind coverage and to charge premiums based on pre-existing conditions (including age). The law also puts limits on the benefit designs that can be offered for sale on the health insurance exchanges including regulations requiring a minimum "medical loss ratio," which require that upwards of 80 percent of premium dollars be spent on clinical services (as opposed to administration or profit). Finally, PPACA imposes additional taxes and fees on the insurance sector.

PPACA also contains provisions that can be expected to benefit pharmaceutical firms and ones that can be expected to harm them. On the beneficial side, PPACA substantially increases the number of people with health insurance and consequently with prescription drug coverage. On the other hand, the bill disallows reimbursement for over-the-counter drugs through tax-advantaged flexible spending accounts and increased manufacturers' drug rebates for Medicaid participants. Perhaps most importantly, as part of a deal struck with pharmaceutical

⁴ See http://www.kff.org/healthreform/upload/housesenatebill_final.pdf for a summary of the major provisions of the House, Senate and final versions of Health Reform legislation.

manufacturers, PPACA requires pharmaceutical manufacturers to provide \$80 billion in savings over a decade, part of which would be used to fill the Medicare Part D “doughnut hole” between \$2,000 and \$6,154 in annual drug expenditures where seniors are currently required to pay 100% of the cost of their prescription drugs.⁵ In exchange for this promise, the White House agreed not to pursue further limits on drug companies in Health Reform, including allowing the government to directly negotiate the prices of drugs purchased for Medicare participants.

Ultimately, whether PPACA is expected to be, on net, positive or negative for healthcare firms, and for health insurance and pharmaceutical companies in particular, is an empirical one. Characterizing the sign and magnitude of these effects is the subject of this article.

To identify the impact of PPACA on insurance company stocks, we exploit the surprise victory of Republican Scott Brown over Democrat Martha Coakley in the Massachusetts special election to replace the late Edward Kennedy (Democrat) in the Senate. Brown’s victory, which deprived Democrats of their filibuster-proof majority in the Senate and consequently reduced the likelihood of a final bill being passed into law, was largely unanticipated until shortly before the election. Thus, if Brown’s victory is associated with positive abnormal return to healthcare stocks, this suggests that markets interpreted Health Reform⁶ as harmful to the healthcare industry, and vice-versa in the case of a negative abnormal return.⁷

Using a regression-based event-study approach, we find that Brown’s victory induced a positive and significant overall effect on healthcare stocks.⁸ A typical dollar invested in the healthcare sector realized a 2.2 percent Cumulative Abnormal Return (CAR) between January 14, 2010 and January 20, 2010. Investments in pharmaceutical firms earned a CAR of 2.9 percent, and investments in managed-care companies (i.e., health insurers) earned a CAR of 6.3 percent. Thus, the market appears to have judged Health Reform to be harmful to the healthcare industry overall and in particular to insurance and pharmaceutical firms. However, not all firms experienced gains following the election. In particular, we find that investments in healthcare

⁵ <http://www.time.com/time/politics/article/0,8599,1915139,00.html>

⁶ In the fall of 2009, the House and Senate each passed health reform bills. The bills were not identical, and, as such, any final bill would result from negotiations between the two houses. Throughout the paper, we use the term “Health Reform” to refer to the merged bill that would ultimately be passed.

⁷ We focus on the Brown election rather than the actual enactment of the bill because the election represented a significant shock to the likelihood of the bill’s passage. In contrast, confidence in the bill’s passage grew slowly but steadily in the weeks leading up to its enactment. Thus, it is likely that by the time the bill was actually signed, markets had already incorporated its impact into equity prices.

⁸ One exception is in the facilities (hospitals) sub-sector, where we find a negative effect, most likely due to the fact that Health Reform was widely expected to increase hospital utilization.

facilities (e.g., hospitals) experienced abnormal losses of 3.4 percent following the election, consistent with the idea that Health Reform, which was expected to reduce the amount of uncompensated care hospitals were forced to provide, was good for the facilities subsector.

The event study approach used in this paper, first introduced by Fama *et al.* (1969), has been used for over forty years to study the behavior of stock market prices around events such as earnings announcements and changes in regulatory, tax, fiscal or monetary policy.⁹ Although the majority of these studies have focused on “economic” events, a number have considered, as does the present study, the impact of political events on equity prices. Knight (2006) studies the Bush/Gore 2000 election and shows that, relative to what would have happened if Al Gore had won the race, “Bush-favored” firms enjoyed a 9 to 16 percent higher return under the Bush administration.¹⁰ Other work on the 2000 election estimates that the delay in determining the results of the 2000 election resulted in lower returns on the U.S. (Nippani and Medlin, 2002) and Mexican and Canadian (Nippani and Arize, 2005) stock markets. Ferri (2008) studies the 2004 Bush/Kerry election and shows that Bush’s victory, which was unexpected when stock markets closed on election day, was associated with a positive movement in equity values. Jayachandran (2006) studies Senator James Jeffords’ 2001 decision to leave the Republican party, shifting control of the U.S. Senate to the Democrats, and finds that firms that made donations to Republicans in the previous election cycle experienced negative returns following Jeffords’ switch, while Democratic donors experienced positive returns. In related work, Den Hartog and Monroe (2008) show that the Jeffords switch was associated with negative returns for the oil and gas industries (which were favored under Republican policy) and positive abnormal returns for renewable energy stocks (which were favored under Democratic policy). Friedman (2009) examines the impact of the passage of Medicare Part D on pharmaceutical firms’ profit using stock market returns and finds that Part D significantly increased the profit for makers of prescription drugs with high Medicare demand.

The remainder of this paper proceeds as follows. Section II discusses the timeline of the Massachusetts Special Election and ex ante expectations for the impact of Health Reform on healthcare stocks. Section III presents the data and empirical strategy, and Section IV contains

⁹ See MacKinlay (1997) and Binder (1998) for general surveys of the uses of these methods and Kothari and Warner (2007) for a more in-depth summary of the econometrics of event studies.

¹⁰ In addition to the results of the paper, Knight (2006) also provides an extensive review of the literature on event studies and political events.

the basic results. Section V discusses individual Managed Care firms, Section VI discusses robustness and extensions, and Section VII concludes.

II. Health Reform and the Massachusetts Special Election

A. Background and Timeline

In the summer and fall of 2009, the Democratic Party controlled the House of Representatives, the Senate and the White House. Consequently, they set the country's legislative agenda and the Health Reform proposals brought before Congress were written and supported almost exclusively by Democrats. During this period, the Democratic caucus controlled 60 votes in the United States Senate, including 58 Democrats and Independents Bernard Sanders (VT) and Joseph Lieberman (CT). Due to the Senate's rules, 60 votes are required to end debate on a proposed bill and move to a vote. And, in light of strong, across-the-board Republican opposition to the proposals, without the support of 60 Senators it was highly unlikely that the Democrats would be able to bring proposed health care legislation to the floor for a vote.

Senator Edward Kennedy (D., MA) died on August 25, 2009 after a sixteen month battle with brain cancer.¹¹ On September 24, 2009, Massachusetts governor Deval Patrick appointed former Kennedy aide Paul G. Kirk Jr., also a Democrat and supporter of Health Reform, to fill the seat that Kennedy had held for 47 years. Kirk would serve until a special election to fill Kennedy's seat was held on January 20, 2010.¹²

In the fall of 2009, the House of Representatives and Senate had each passed a health reform bill. The House version of the bill (H.R. 3962, the "Affordable Health Care for America Act") passed 220-115, with support from 219 Democrats and one Republican.¹³ Thirty-nine Democrats voted against the bill, in many cases because they thought the bill was not ambitious enough. The Senate version of the bill (H.R. 3590, the "Patient Protection and Affordable Care Act") passed 60 – 39 with one Senator not voting. Every Democrat (along with Independents Sanders and Lieberman) voted for the bill, while every Republican voted against the bill (with

¹¹ <http://www.nytimes.com/2009/08/27/us/politics/27kennedy.html>

¹² <http://www.nytimes.com/2009/09/25/us/politics/25massachusetts.html>

¹³ <http://clerk.house.gov/evs/2009/roll887.xml>

the exception of Jim Bunning (KY), who did not vote).¹⁴ Although broadly similar, there were significant differences in the bills. The House version of the bill was somewhat more ambitious than the Senate version, including, in particular, a public health insurance option to be offered for sale to individuals on a national health insurance exchange.¹⁵

Given the disparate bills passed in the two houses of Congress, the standard legislative approach would involve a House-Senate conference committee developing a compromise bill that would then have to be passed again by each house. In this case, the Senate Democrats would require every one of the 60 votes in their caucus to pass the bill, and consequently the contested Massachusetts Senate seat represented the critical, marginal vote that would allow Democrats to overcome Republican opposition and pass a compromise bill. In the event that the Democrats did not maintain their 60 vote supermajority in the Senate, there were still routes to passage which, although somewhat obscure, had been spoken about by pundits and analysts for some time. The first method involved the House passing the Senate's version of the bill. In this case, a second vote in the Senate would not be required. The second involved using the "budget reconciliation" procedure that would allow some changes to be made to the original bills with only a simple majority of supporters in the Senate.¹⁶ Thus, while a Republican victory in Massachusetts would be a serious setback for Health Reform and significantly decrease the likelihood of its passage, it would not necessarily kill the prospects for reform completely.

The Democratic candidate in the Massachusetts special election was state Attorney General Martha Coakley, a supporter of Health Reform.¹⁷ Her opponent was Massachusetts State Senator Scott Brown, who made opposition to Health Reform a centerpiece of his campaign.¹⁸ Consequently, leading up to the special election, it was widely believed that a Coakley victory would likely lead to the passage of a compromise bill based on the House and Senate bills of 2009, while a Brown victory would make it extremely unlikely that such a compromise bill would be passed. Thus, the Massachusetts special election, falling between passage of the bills in the House and Senate and reconsideration of a combined bill, became a critical test for Health Reform as envisioned by President Obama and the Democrats in 2009.

¹⁴ http://www.senate.gov/legislative/LIS/roll_call_lists/roll_call_vote_cfm.cfm?congress=111&session=1&vote=00396

¹⁵ For a comparison of the bills, see http://www.kff.org/healthreform/upload/housesenatebill_final.pdf.

¹⁶ Ultimately, Health Reform was passed using a combination of the House passing the Senate version of the bill and a reconciliation bill. However, the issue for the validity of this study is not whether Scott Brown's election made passage of the bill impossible, but whether it reduced the likelihood of passage. We discuss this point below.

¹⁷ <http://www.nytimes.com/2009/12/09/us/politics/09mass.html>

¹⁸ <http://www.brownforussenate.com/issues>.

Immediately following the primary elections to select candidates to vie for Kennedy's seat, Martha Coakley was considered a strong favorite. Massachusetts is a strongly Democratic state, having supported the Democratic candidate for President in each of the last six elections. Prior to Brown's election, Massachusetts's ten Representatives to the House of Representatives and both Senators were Democrats. Massachusetts's last Republican Representatives left office in 1997, and the last Republican Senator left office in 1979. As mentioned earlier, Kennedy had held the seat in question for 47 years.

Early polling placed Coakley well ahead of Brown. A Suffolk University/7News poll conducted in November, before the parties had chosen their candidates, put Coakley ahead of Brown in a hypothetical race by a 31 point margin, 58% to 27%. This perceived lead persisted into 2010, with a January 10th Boston Globe story showing Coakley up by 15 – 17 points.

The race between Brown and Coakley began to tighten around the second week of January, when a group of polls emerged that showed Brown and Coakley in a statistical dead heat.¹⁹ Then, around January 15, several polls emerged showing Brown had taken a 10-15 point lead over Coakley. On Friday, January 15th, President Obama announced that he would travel to Massachusetts to campaign for Coakley on Sunday, January 17th.²⁰

In the January 19th election, Brown defeated Coakley 51.9 percent to 47.1 percent. The Boston Globe described the Brown victory as “one of the biggest upsets in Massachusetts political history,” saying “the stunning, come-from-behind victory caps a dramatic surge in recent days as Brown ... roared ahead of Coakley.”²¹

The dramatic shift in the race, from polls showing a 15 point lead for Coakley to showing a similarly-sized lead for Brown, culminating in Brown's 5 point victory, can be attributed to several factors. First, due to the Democrats' strength in Massachusetts, Coakley and her staff underestimated Brown's ability to mount a serious challenge. Consequently, Coakley adopted the role of “aloof front runner” in the race, eschewing personal appearances and even going so far as to go on vacation over the holidays, with fewer than 20 days left before the election.²² As a result, Coakley lacked a strong image in voters' minds, and this left her vulnerable to several

¹⁹ See http://www.realclearpolitics.com/epolls/2010/senate/ma/massachusetts_senate_special_election-1144.html.

²⁰ http://www.boston.com/news/politics/2008/articles/2010/01/16/obama_steps_into_suddenly_taut_senate_race/

²¹ http://www.boston.com/news/nation/articles/2010/01/20/republican_trounces_coakley_for_senate_imperils_obama_health_plan/

²² <http://www.washingtonpost.com/wp-dyn/content/article/2010/01/14/AR2010011404607.html>; <http://www.washingtonpost.com/wp-dyn/content/article/2010/01/15/AR2010011504069.html>. See also http://www.boston.com/news/local/breaking_news/2010/01/coakley_underes.html for an in depth discussion of how and why Coakley's team underestimated Brown.

missteps she made late in the campaign, most notably referring in a January 15th radio interview to Boston Red Sox hero Curt Schilling as a fan of the New York Yankees. This led Schilling, a Brown supporter, to begin a series of media interviews and robo-calls in which he questioned Coakley's ability to represent the people of Massachusetts.

The Republicans, on the other hand, took advantage of the Democrats' complacency. Although early internal polling found the race between Brown and Coakley to be much closer than widely believed, the Republicans did not widely disseminate these results. Instead, Scott Brown took to the streets in a series of public appearances, and it turned out that he was a surprisingly effective "retail campaigner."

The press was also slow to pick up on the changing tides in the Massachusetts election. After running initial stories on how Coakley was expected to win the election, the major newspapers did not catch onto changing sentiment in Massachusetts until late in the race. *The New York Times*, *The Washington Post* and *The Los Angeles Times* did not run stories suggesting the Massachusetts race might be closer than expected until Jan. 8, 11 and 14, respectively. Even the Boston Globe did not make a major shift in its coverage of the race until Jan. 15, when it noted that Democrats were panicking about the neck-and-neck campaign. Television news was even slower to report the story, with ABC News first reporting on the closeness of the race on Jan. 15 and CBS and NBC news not reporting on this until Jan. 17, once President Obama had gone to Massachusetts to campaign for Coakley.²³

Another factor contributing to the rapid movement in the polls and Brown's surprise victory was the unusual nature of the election. If not the first of its kind, statewide special elections of this sort are certainly unusual. Given the lack of a history of similar elections to draw on, polling data in special elections is extraordinarily noisy, as are the results of the elections, which are highly sensitive to which potential voters decide to go to the polls in an off-cycle election, in this case one taking place in January in Massachusetts.

In addition to the inherent uncertainty surrounding the election, differences in polling methods also played a role in the Democrats and the media failing to take notice of the narrowing race. The polls that showed the greatest lead for Coakley were those that included the widest number of potential voters, while polls that focused on likely voters showed a much

²³ See Howard Kurtz in *The Washington Post* for a comprehensive discussion of the media "Missing the Mark in Massachusetts," <http://www.washingtonpost.com/wp-dyn/content/article/2010/01/25/AR2010012500741.html>.

narrower race. Because of this, the turnout model used to convert the raw data to projections about behavior in the election is crucial, and in this case there was little guidance on what the right model was. For example, the polls that showed the narrowest gap between the candidates used automated “robo-callers” to survey likely voters, a method that is often dismissed as flawed. However, given that those who are willing to respond to automated polls are likely to be highly motivated to vote, in this case the automated polls may have been more accurate than those conducted by human interviewers.

Nevertheless, even as public polls began to show the race narrowing, the Democrats tended to interpret the results in light of their perceived advantage, dismissing them as flawed. For example, in one debate Coakley dismissed questions about polls showing the race as narrowing saying only “I think everyone will see where we are on Jan. 19.”²⁴

For these reasons and more, Scott Brown’s surprise victory in Massachusetts provided an unforeseen shock to the likelihood of Health Reform being passed into law. As long as Brown’s victory was not fully anticipated by equity markets, this event can be used to study the impact of a decrease in the likelihood of health reform on equity prices and thus whether Health Reform was expected to be a “dream” or a “nightmare” for health insurers and other health care firms.

Evidence on the surprise embodied in the Brown victory is provided by the prediction market Intrade.com, which offered contracts on the likelihood of a Brown or Coakley victory.²⁵ The Intrade.com contract on a Brown or Coakley victory paid \$100 if the named candidate and \$0 otherwise. Thus, the contract price (divided by 100) can be interpreted as the market’s view of the likelihood of the named candidate winning the election. Figure 1 depicts the daily closing prices of the Intrade.com contracts on victory for Brown and Coakley. Due to the presence of a third candidate, Joseph Kennedy (no relation to the deceased Senator), the numbers need not sum to 100. Through January 9, the victory probabilities stood steady at around 90% for Coakley and 10% for Brown. Over the next week, the contracts moved around somewhat, inching toward 70/30 in favor of Coakley at the January 15th close.²⁶ Over the weekend, however, the contracts

²⁴ http://www.politico.com/blogs/scorecard/0110/Coakley_Brown_square_off_in_testy_debate.html

²⁵ Snowberg, Wolfers and Zitzewitz (2008) suggest directly using the intrade.com prices as independent variables rather than the occurrence of a particular event. We do not adopt this here due to the fact that the Brown and Coakley markets were relatively thinly traded and, while a Brown victory would presumably move the market’s assessment of the likelihood of Health Reform being enacted, it is not a direct measure of this assessment. Since the election represents a clean event, we instead adopt the simpler event-study approach.

²⁶ Interestingly, Brown’s January 10th bump coincided with the Boston Globe’s publication of its poll showing Coakley held a 15 point lead in the polls. However, the same article suggested that there were some “glimmers of

reversed, closing at 77 for Brown and 25 for Coakley on January 18 before Brown's eventual victory the next day. Thus, much of the movement in expectations regarding the likelihood of a Brown victory occurred between the end of trading on January 15 and election day. Conveniently for the sake of this study, the markets were closed on Monday, January 18, in observance of the Martin Luther King holiday. Thus, while new information accumulated over the weekend, markets were unable to incorporate this information between the close of trading on January 15 and the opening on election day, January 19.

In light of this, it does appear that Brown's victory came as a surprise to the markets and, as such, can be used to gauge the impact of the decline in the likelihood of health reform being passed on health care industry stocks. Unfortunately, there was no Intrade contract for Health Reform at the time of the Brown-Coakley election, so it cannot be used to directly test the relationship between the election and the likelihood of Health Reform's passage or between Health Reform and stock prices.

B. Empirical Hypotheses

As discussed in the introduction, in the case of health insurers and pharmaceutical firms, Health Reform contained both beneficial and harmful provisions. Consequently, the expected impact of Health Reform on these sub-industries is ambiguous. Determining the signs of these effects is one of the major purposes of this article.

However, while the *ex ante* impact on insurance and pharmaceutical sub-industries was ambiguous, Health Reform was expected to have an unambiguous effect on a number of other parts of the healthcare industry, including hospitals, medical device manufacturers and participants in government programs such as Medicare Advantage and Medicaid Managed Care.

Regarding hospitals, over its first decade Health Reform is expected to substantially reduce the number of uninsured people in the country, which would benefit hospitals in two ways. First, insured consumers tend to use (and pay for) substantially more health care than uninsured ones, including hospital services. Second, the movement of so many people from the ranks of the uninsured to the insured is expected to radically reduce the amount of charity care that hospitals will have to provide. Hospitals are required to care for patients who present

hope for the Republican," possibly leading Intrade.com traders to revise their beliefs about the possibility of Brown winning the election. http://www.boston.com/news/politics/2008/articles/2010/01/10/senate_poll_coakley_up_15_points/

themselves at the Emergency Department, whether the patient can pay or not. As such, they are forced to care for patients who will not or cannot pay for the care they receive. This unpaid or “charity” care is estimated to have cost hospitals \$36 billion in 2008. Health Reform, by insuring many of these patients, is expected to significantly reduce hospitals’ unpaid care (as well as increase utilization by those with insurance). As such, we expect that health reform will benefit hospitals and therefore that Brown’s election (corresponding to a decrease in the likelihood of Health Reform being passed) will have a negative effect on hospitals’ stock prices.²⁷

Health Reform was also expected to have an unambiguous impact on medical device manufacturers. Both the House and Senate versions of Health Reform imposed new taxes and/or fees on medical devices, with the Senate bill imposing fees of \$2 billion, growing to \$3 billion in 2017, and the House bill imposing a 2.5% tax on the first sale of medical devices.²⁸ Since Health Reform harms device manufacturers, we expect Brown’s election to be associated with a positive return to device manufacturers.

Finally, although Health Reform was expected to have an ambiguous impact on health insurers overall, the impact on participation in various government programs was not. Health Reform significantly scaled back the payments made to firms caring for patients in the Medicare Advantage (Medicare Part C) program. Thus we might expect firms that receive a larger share of their business from this program to benefit (relatively) less from Health Reform. On the other hand, Health Reform increased eligibility for Medicaid, which was expected to benefit firms providing care to these new enrollees through Medicaid Managed Care plans.²⁹ Thus we expect that insurers with a greater share of their business from Medicaid Managed Care will benefit more from Health Reform. In terms of the election, we expect Scott Brown’s election to be better for firms with greater Medicare Advantage involvement, and to be worse for firms with greater Medicaid Managed Care involvement.

²⁷ See Abelson, Reed, “Bills Stalled, Hospitals Fear Rising Unpaid Care,” *The New York Times*, Feb. 8, 2010, <http://www.nytimes.com/2010/02/09/health/policy/09hospital.html>, accessed June 22, 2010.

²⁸ See http://www.kff.org/healthreform/upload/housesenatebill_final.pdf.

²⁹ In particular, Health Reform was expected to add about 16 million to the ranks of Medicare, with the federal government initially providing 100 percent funding for newly-eligible beneficiaries, most of whom would receive care through private managed care plans. Health Reform also increased Medicaid reimbursements. <http://www.kff.org/medicaid/upload/8139.pdf>

III. Data and Empirical Strategy

We analyze the impact of Scott Brown's election on firms in the health care industry using total return data on 3674 firms from the Center for Research in Security Prices (CRSP) database. This represents all firms traded on the NYSE and NASDAQ exchanges that are part of the S&P Total Market Index (SPTMI) with total return data available during the study period. The SPTMI seeks to represent the entire universe of U.S. equities. In order to study the impact of the election on the healthcare industry, we classify a firm as belonging to the healthcare industry based on its S&P Global Industry Classification Standard (GICS) code. In particular, we classify a firm as belonging to the healthcare industry if its two digit GICS code is 35. The GICS codes are acquired from COMPUSTAT and cross-matched to the returns data based on their Committee on Uniform Security Procedures (CUSIP) codes.

We begin our analysis of the anticipated impact of Health Reform on the broad health care industry by estimating the impact of Scott Brown's election on all publicly traded healthcare firms in the CRSP database. In order to get a sense of whether the impact of Brown's election on major industry players differed from the impact on smaller ones, we further subdivide firms based on whether they are constituents of one of four S&P Industry Select Portfolios (SPISP): Health Care Equipment, Health Care Services, Pharmaceuticals and Biotechnology. Using SPISP healthcare firms is a more inclusive definition of what it means to be a "major" healthcare firm than using healthcare firms in the S&P 500 index. Using the latter definition changes the results only slightly.³⁰

In order to get a more detailed view of the election's impact, we next classify the firms into each of the ten healthcare sub-industries contained in the SPISP based on the S&P Global Industry Classification Standard (GICS) classification, namely: Health Care (HC) Distributors, HC Equipment, HC Facilities, HC Services, HC Supplies, HC Technology, Biotechnology, Life Sciences Tools and Services, Managed HC, and Pharmaceuticals.³¹ Health insurers are included in the Managed Healthcare subsector, hospitals are included in the Facilities subsector, and medical device manufacturers are classified in the Equipment subsector.

³⁰ As our results tend to be concentrated in major firms, we find a slightly larger average impact on healthcare firms in the S&P 500 than we do on SPISP healthcare firms.

³¹ Similar results hold for sector definitions based on North American Industry Classification System (NAICS) codes.

To analyze the impact of Scott Brown's election on firms in the healthcare sector, we adopt a regression-based event-study approach to estimate the change in return of these companies operating in the health industry as a result of the surprising election of Scott Brown. The method is, in principle, quite simple. We treat Brown's election as an exogenous shock to the likelihood of health reform being passed, and thus any abnormal returns to health care equities beyond what can be accounted for by movements in the overall market and other known risk factors following the election can be attributed to the impact of the election.

In order to allow for the fact that the likelihood of Brown's victory may have been incorporated into stock prices in the days before the election and/or may not have been fully incorporated on election day (since the polls did not close until after the market did), we consider an event window beginning two trading days before the election day and ending one day after it. Thus the four trading days in the event window range from Thursday, January 14th to Wednesday, January 20th (inclusive). Our choice of the start date of the event window is motivated (as per Snowberg, Wolfers, and Zitzewitz (2008)) by referring to the Intrade prediction market. As Figure 1 shows, the odds of Scott Brown winning the elections started to increase dramatically on January 14, 2010. Although a case could be made for starting the event window slightly earlier, one of the managed care firms we study, Aetna, announced in its 8-K quarterly earnings filing on January 12th that it expected lower earnings in 2010 than 2009. Hence, we start our event window on January 14th in order to allow markets to fully incorporate this news and avoid contaminating our study.

The basic strategy of the analysis involves comparing firms' actual returns during the event window with what their return should be based on a 1000 trading-day estimation window. To be as inclusive as possible, we include all firms for which returns were observed on at least 50 days in the estimation window. The results are substantially unchanged if we restrict the sample to only those firms whose returns are observed for all 1000 days in the estimation period or to only those firms in the S&P 500.

We begin our analysis by estimating a Fama-French three-factor model for the 1000 trading days preceding the event window for each firm in the CRSP database (whether or not the firm is a healthcare firm). The Fama-French model (Fama and French, 1992; 1993) predicts the firm's return on any given day based on the relationship between the firm's return and the return on the market portfolio and two other risk factors that have been shown to influence equity

returns, the difference between the return on stocks with small and large market capitalization (the “small minus big” or SMB factor) and the difference between the return on stocks with high and low book-to-market value (the “high-minus-low” or HML factor). The estimation equation takes the form:

$$R_{it} - R_{ft} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + \beta_{si} \cdot SMB_t + \beta_{hi} \cdot HML_t + \varepsilon_{it} \quad \text{Eq. (1)}$$

where R_{it} is the daily total return rate of firm (i) on day (t), R_{mt} is the total return to the CRSP market portfolio, R_{ft} is the risk free interest rate at time t , SMB_t is the Fama-French “small minus big” factor at time t , and HML_t is the Fama-French “high minus low book-to-market” factor at time t and ε_{it} is the error term for company i during period t . SMB captures the historic excess return of diversified portfolios of small market capitalization stocks over portfolios of large ones, while HML captures the historic excess return of high book-to-market stocks over low ones.

The estimated parameters from applying ordinary least squares to Eq. (1) for each firm can be used to predict the firm’s expected return during each of the event days as: $R_{it} = R_{ft} + \hat{\alpha}_i + \hat{\beta}_i (R_{mt} - R_{ft}) + \hat{\beta}_{si} \cdot SMB_t + \hat{\beta}_{hi} \cdot HML_t$. The impact of Brown’s election on healthcare companies is assessed using the firms’ Abnormal Return (AR), which measures the difference between actual returns for these equities during the event window and their predicted returns. Hence, the (AR) of company (i) on day (t) is equal to;

$$AR_{it} = (R_{it} - R_{ft}) - (\hat{\alpha}_i + \hat{\beta}_i (R_{mt} - R_{ft}) + \hat{\beta}_{si} \cdot SMB_t + \hat{\beta}_{hi} \cdot HML_t) \quad \text{Eq. (2)}$$

Finally, we determine each firm’s cumulative abnormal return (CAR) over the four-day event window as:

$$CAR_i = \left[\prod_{t=1}^4 (1 + AR_{it}) \right] - 1 \quad \text{Eq. (3)}$$

In the analysis, we examine the results of regressions of the form:

$$CAR_i = \alpha_i + \sum_j^J \beta_j D_{ji} + \sum_k^K \gamma_k x_{ki} + u_i \quad \text{Eq. (4)}$$

where D_{ij} are a series of sector- or sub-sector-level dummy variables (e.g., whether the firm is a health care firm), x_{ik} are (potentially) a series of individual-level controls and u_i is a firm-specific error term, assumed to have zero mean conditional on the dependent variables. Thus,

our estimation strategy compares the CAR during the event window for firms in the healthcare sector to those outside of the healthcare sector.³²

The regression in Eq. (4) takes the firm as the unit of observation. Thus, regression coefficients tell us the impact *on a randomly chosen firm* of Scott Brown's election due to the covariate. While this question is of interest, it treats small and large firms equally. Given that the market for small-firm stocks tend to be less liquid and consequently noisier, this may result in small firms exerting undue influence over the regression results. To address this, in addition to equally weighted regressions, we also run regressions that are weighted by firms' market capitalization. The market-capitalization-weighted regressions have the additional benefit that the coefficients are interpretable as the impact of Brown's election on an average dollar invested in the stock market, rather than the impact on an average firm.

If equity markets are efficient, then they will incorporate new information into prices relatively quickly. Taking this as given, the assumptions necessary for regression coefficients to identify the impact of Brown's election on healthcare stocks are that (i) the outcome of the election came as a surprise and so its impact was not incorporated into stock prices before the election took place, (ii) that no other events occurred during the event window that might affect firms' abnormal returns, and (iii) that Scott Brown's election did not affect the likelihood of other policy changes along dimensions that cannot be controlled for in our analysis.³³ A final critical assumption is (iv), that Scott Brown's election actually *decreased* the market's perceived likelihood of Health Reform's passage, rather than increasing it. We begin by discussing the first two assumptions here. The final two, which are critical for interpreting the results, are taken up in Section V.

We argued that Brown's victory was, in fact, a surprise in the previous section, and our choice of the four-day event window was driven by the need to exclude the possibility of other events contaminating the event window. To further address the question of whether there were other events related to the healthcare industry that took place during the event window and might contaminate it, we reviewed the First Call Historical database, the NewsBank World News

³² A different approach would compare firms' behavior during the event window to behavior during the estimation window, using time-series variation rather than cross-sectional variation to identify the impact of Brown's election. Although we adopt the cross-sectional approach to facilitate consideration in Section VI of whether observed changes during the event window might have been caused by changes in policies other than Health Reform, the basic results using the time series approach are quite similar.

³³ Examples of other policies that might have been affected by Brown's election include labor reform legislation, dividend tax reform legislation, and financial sector reform.

service, and Lexus/Nexus Academic for relevant news stories concerning health care firms in the SPISP during the event period, searching for each by name and stock ticker. Although some firms received idiosyncratic news during the event period, the news was not systematically good or bad, and such events there were (e.g., court rulings, recalls) were rare and unlikely to have broad effects at the industry or sub-industry level.³⁴ The major exception is Aetna's "negative-surprise" earnings announcement on January 12th discussed above, which could be interpreted as bad news for the industry in general and led us to choose January 14th as the start of the estimation window.

IV. Basic Results

Tables 1 and 1a present the results of the analysis for all health care firms, for firms decomposed into whether or not they are constituents of the SPISP, and for firms decomposed into healthcare subsectors.³⁵ The dependent variable in Tables 1 and 1a is a firm's CAR over the four day event window. Columns 1 – 3 of Table 1 present equally weighted regressions, so that coefficients should be interpreted as the impact on a typical firm. Robust standard errors are used throughout the paper.

Column 1 regresses firm-level CARs on an indicator for whether the firm is in the healthcare sector (i.e., two-digit GICS code 35). We find that a typical firm experienced an abnormal return of approximately 6 tenths of a percent, statistically significant at the 10 percent level ($p = 0.07$). Column 2 splits the regression by whether the healthcare firm is also in the SPISP and reveals that the positive abnormal return is concentrated among healthcare firms in the SPISP, where we find a CAR of 1.33 percent ($p < 0.01$). Figure 2 shows cumulative abnormal returns for all healthcare firms, for SPISP healthcare firms and for non-SPISP healthcare firms over the four event days.

Column 3 of Table 1 splits the healthcare industry into 10 subsectors, revealing a positive, statistically significant CAR of 2.85 percent in the Managed Care sector. This

³⁴ Events affecting only a single firm are captured by the idiosyncratic shock to firms' abnormal returns and will not bias the estimates of the impact of the election.

³⁵ During the event window, several prominent firms in the financial sector issued earnings announcements. Consequently we include a dummy variable for whether the firm is in the financial sector in all regressions. The results do not change substantially if financial firms are dropped from the regressions entirely, as is common practice in the finance literature (e.g., Fama and French, 1992). Not including the dummy variable reduces statistical significance in some cases, but the main effects remain highly statistically significant (particularly in the value-weighted regressions).

represents our first evidence that Scott Brown's election benefitted health insurance companies, i.e., that markets perceived Health Reform as being harmful to health insurers.

Column 1 of Table 1a, which presents an equally-weighted regression further splitting the subsectors according to whether firms are in the SPISP, reveals a number of additional interesting nuances to the results. Again, statistically significant results are concentrated in healthcare firms that are also in the SPISP. We find a strong, positive effect on SPISP firms in the Managed care sub-sector, where a typical firm experienced a CAR of 7 percent during the event window. SPISP Pharmaceutical firms also experienced significant gains, with a CAR of 3.3 percent. Thus, Brown's election appears to have been beneficial for healthcare stocks as a whole as well as the Managed care and Pharmaceutical sectors.

Column 1 of Table 1a also finds a CAR of *negative* 3.1 percent in the SPISP Facilities sector, which includes hospitals. This result confirms the expectation discussed above that Health Reform, by increasing utilization and reducing charity care, would benefit hospitals.

Tables 1 and 1a also reveal positive CARs of 1.5 to 2 percent for the healthcare Equipment sector, depending on the specification. Interestingly, this positive CAR is statistically significant even for the non-SPISP firms. Again, this result agrees with *ex ante* expectations for the subsector due to the taxes and fees Health Reform imposed on medical device manufacturers. Figure 3 depicts CARs by event day for the SPISP Equipment, Facilities, Managed Care and Pharma sectors.

The lack of significant findings for firms outside the SPISP may be due to any of several factors. The first is that the firms in the SPISP are the major firms in the market. Firms outside of the SPISP may be lesser-known and somewhat thinly traded, the result being that it takes longer for shocks to translate into price movements for these stocks. In addition, as noted above, there is expected to be heterogeneity in the impact of Brown's election across healthcare subsectors, and inspection reveals there seems to be more noise in firms' classification outside of the SPISP than there is inside. If this is the case, that would tend to reduce the likelihood of finding a statistically significant impact (in either direction) of the election on these stocks.

Columns 4 – 6 of Table 1 and Column 2 of Table 1a present the results for market-capitalization weighted regressions, which aid in interpretation of the results for two reasons. First, since we have found different effects depending on whether the firm is in the SPISP, which is generally correlated with size, weighting regressions by market-capitalization incorporates

these differences. Second, the coefficients on the weighted regressions have a straightforward interpretation. They represent the impact of Brown's election on a typical dollar invested in the stock market.

The results here are broadly consistent with those of the equally-weighted regressions, although the effects tend to be larger in magnitude due to the fact that the effects tend to be concentrated in firms in the SPISP and these firms, which tend to be larger, are given greater influence in the weighted regressions. We find that a typical dollar invested in the healthcare sector experienced a CAR of about 2.15 percent, with investments in the managed-care and pharmaceutical subsectors experiencing CARs of 6.3 and 2.9 percent, respectively. A typical dollar invested in the equipment subsector had a CAR of 1.9 percent, while one invested in the facilities subsector experienced a CAR of *negative* 3.37 percent. Figures 4 and 5 adapt Figures 2 and 3, showing CARs over the event window for all healthcare firms, SPISP healthcare firms, and non-SPISP healthcare firms as well as selected industry subsectors using market-capitalization weighted averages.

Before continuing the analysis, a comment on interpreting the magnitude of the effects is in order. While we find an overall CAR of 2.15 percent associated with Brown's election, this is not the same as saying that Health Reform was expected to decrease the market value of investments in the healthcare sector by 2.15 percent. This would only be an appropriate conclusion if the probability of reform were one before the election and zero after.³⁶ Otherwise, the estimate must be scaled by the change in the probability of reform and our results represent lower bounds on the magnitude of the effect of Health Reform on healthcare firms. Thus, if the election decreased the probability of reform from 0.8 to 0.2, the appropriate back-of-the-envelope computation would be that reform was expected to decrease the value of the firms in our sample by $2.15/(0.8-0.2) = 3.58$ percent. These concerns do not, however, affect the interpretation of the signs of the effect. Thus, a positive abnormal return associated with the election corresponds to Health Reform being expected to harm firm interests *as long as Brown's election decreases the probability of reform*. We turn to this and other issues in interpreting the results in the Section VI.

³⁶ As discussed below, it also requires that the election affected only the likelihood of Health Reform passing, not the nature of the bill that the markets expected to be passed.

V. Detailed Analysis for Managed Care

A. Results for Individual Managed Care Firms

One of the main goals of Health Reform is to expand insurance coverage by reforming insurance markets. Due to the importance of the insurance industry for both the political debate and real impact of Health Reform, in this section we investigate the firms in the managed care segment in more detail, focusing on those firms in the SPISP, which include all of the major commercial insurers.

The firms in the SPISP Managed Care segment are Aetna, CIGNA, Coventry Health Care, Humana, Unitedhealth and WellPoint. These firms are also constituents of the S&P 500, suggesting that not only are they important within healthcare, but that they are major firms even when compared to the overall market. To evaluate the size of the election's impact on these firms, rather than rely on regressions with so few observations we instead employ on a simple, nonparametric test, comparing the CAR for each firm in the segment with the distribution of CARs for firms in the S&P 500 outside of the healthcare and financial sectors.³⁷ The CAR for a firm is unusually large if it appears in the right-tail of this distribution.

Table 2 reports the CAR for each firm and the probability that a randomly chosen CAR from the set of S&P 500 firms in neither the health nor the financial sectors is greater or equal to the firm's CAR. Each of the Managed Care firms reports a positive CAR, ranging from 4.8 percent for Wellpoint to 9.7 percent for Humana. The probability of a randomly drawn CAR being larger than Wellpoint's is approximately 4 percent, while the probability for Human is less than 1 percent. Thus, in all cases, the CARs for major health insurance companies are unusually large relative to those of other firms in the S&P 500. We thus conclude that not only did the election benefit Managed Care firms on average, but also did so for each major firm individually. Figure 5 plots the CARs for these individual firms over the four day event window.

B. Relationship Between CARs and Involvement in Government Healthcare Programs

Next, we consider the extent to which individual insurers' CARs varied depending on the firms' involvement in government healthcare programs. As discussed above, Health Reform

³⁷ We exclude financial sector firms due to the earnings announcements during the event window discussed above.

reduced reimbursements for health insurers participating in the Medicare Advantage program and increased eligibility for Medicaid, which was expected to benefit firms providing care to these new enrollees through Medicaid managed care plans, which stood to benefit greatly from reform.³⁸ Consequently, we expect to observe firms that are more reliant on the Medicare Advantage program to experience larger CARs and firms that are more reliant on the Medicaid program to experience smaller ones.

As a first test of these hypotheses, we classified firms as serving “Medicare Advantage,” or “Medicaid” or “Medicaid Managed Care” based on a search for each of these terms in the firm descriptions on Google finance.³⁹ Note that, due to the method, all firms classified as participating in Medicaid Managed Care are also classified as participating in Medicaid. Although somewhat crude, reading the descriptions verified that the method, for the most part, succeeded in identifying firms involved with each of these programs. We then regressed firm-level CARs on dummy variables for whether the firm’s description contained Medicare Advantage, Medicaid or Medicaid managed care.

Results are presented in Table 3. The first column includes the dummy variables for Medicare Advantage and Medicaid Managed Care only, and we find a strong positive effect for firms participating in Medicare Advantage and a negative effect on firms involved with Medicaid managed care. The second column adds the Medicaid dummy variable. Here we find that the effect on Medicare Advantage is positive and the effect on Medicaid overall is negative but not statistically significant. In this specification, the appropriate test for whether there is an impact on firms participating in Medicare Managed Care is the F-test for the null hypothesis that the sum of coefficients on Medicaid and Medicaid Managed Care is zero. The results show that this hypothesis can be rejected at the 5 percent level of significance.

As a second test of this hypothesis, for each of the firms in the Managed Care subsector we gathered data from the firm’s 2009 annual reports and/or 10k filings on the number of members in their Medicare Advantage, Medicaid and commercial insurance segments (measured

³⁸ In particular, Health Reform was expected to add about 16 million to the ranks of Medicare, with the federal government initially providing 100 percent funding for newly-eligible beneficiaries, most of whom would receive care through private managed care plans. Health Reform also increased Medicaid reimbursements.

<http://www.kff.org/medicaid/upload/8139.pdf>

³⁹ Similar results hold using definitions based on lists of top firms serving Medicare Advantage (Kaiser Family Foundation) and Medicaid Managed Care (USAToday).

in thousands) and the amount of revenue received (measured in millions of dollars) from each of these sources.⁴⁰

Table 4 presents results of regressions of firms' CARs on these variables. Columns 1 and 2 demonstrate a positive relationship between a firm's Medicare Advantage membership and its CAR, and a negative relationship between Medicaid membership and CAR, once again confirming ex ante expectations that Health Reform would benefit firms with significant Medicare Advantage business less and benefit with significant Medicaid business more. The inclusion in column 2 of a dummy variable for whether the firm is in the SPISP changes the results only slightly, ruling out the possibility that the observed effects arise due to Medicare Advantage or Medicaid involvement serving as a proxy for being in the SPISP, which we know to be positively related to CAR. Columns 3 and 4 show results for regressions of CAR on revenue from the various sectors and demonstrate a similar pattern.

In addition to confirming our ex ante expectations regarding the relationship between Health Reform and participation in Medicare Advantage and Medicaid Managed Care, the results of Table 4 also demonstrate that not only do equity markets react to political events, but that they do so in a rather sophisticated way. Even among health insurers, we find that market returns reflect the firms' heterogeneity with respect to participation in these two programs.

VI. Robustness and Issues in Interpretation

As discussed above, the interpretation of our results as saying that markets viewed Health Reform as being harmful to the healthcare sector overall and to health insurance companies in particular depends on a number of assumptions. In this section we consider two of the assumptions that have not yet been addressed: that Brown's election actually decreased the likelihood of Health Reform being enacted, and that Brown's election did not affect the extent or likelihood of other policy changes along dimensions that have not been or cannot be controlled for. As part of the first point, we also discuss the possibility that the chief effect of Brown's election may not have been on the likelihood of reform, but rather on the expected nature of reform.

⁴⁰ Of the 17 firms in the Managed Care subsector, one America Services Group (ASGR) provides healthcare services to prisons. Magellan Health Services (MGLN), provided revenue data but not enrollment data, while UnitedHealth (UNH) and WellPoint (WLP) provided enrollment data but not revenue data by sector. This resulted in 15 observations with complete membership information and 14 observations with complete revenue information.

We begin with the question of whether Scott Brown's election actually reduced the likelihood of Health Reform being enacted. While this seems likely, it is by no means obvious. As the same time that Scott Brown's election was taking place, pundits and policymakers were discussing how Health Reform might be passed even if Scott Brown won the election. These mechanisms included both the budget reconciliation process and the House passing the Senate's version of the bill.⁴¹ Thus, while losing the 60th Senator reduced the likelihood of Health Reform passing, increasing knowledge of alternative roads to passage would increase the perceived likelihood of Health Reform passing. Depending on the relative strength of these two forces it is possible, at least in principle, that Brown's election coincided with an increase in the market's perceived likelihood of Health Reform. In this case, the interpretation that the positive abnormal return to health insurers implies that markets believed Health Reform to be harmful to their interests would be reversed. That is, if Brown's election made Health Reform more likely and benefitted health insurance stocks, then Health Reform would actually be *good* for insurers.

Because the issue of whether Health Reform is good or bad for the healthcare sector and for health insurers and pharmaceutical companies in particular is the central question of the paper, the sign of these effects cannot be used to shed light on the question of whether Brown's election increased or decreased the likelihood of reform. However, the history of Health Reform and news reports in the days before and after the election suggest that Brown's election did, in fact, decrease the likelihood of reform. In addition, as noted above there are several provisions of the Health Reform bills that suggest unambiguous effects on parts of the healthcare sector, and examining the sign of these effects supports our assumption that Brown's election reduced the market's perceived likelihood of reform passing.

The possibility that Brown's election increased the market's perception of Health Reform's passage hinges on the proposition that the election coincided with an increase in awareness of the alternative methods of passing the bill – use of the budget reconciliation process and having the House pass the Senate's version of the bill – that would not require 60 votes in the Senate. However, news reports show that both Democrats and Republicans were publicly discussing the potential role of the budget reconciliation process in passing health

⁴¹ Ultimately, Health Reform passed using a combination of these methods, with the House first passing the Senate Bill and then both houses passing a reconciliation bill that implemented compromises on several of the provisions in the original Senate bill.

reform as far back as March, 2009.⁴² There is less discussion in the press of the possibility of the House passing the Senate version of the bill. However, unlike the reconciliation process, the possibility that the House could pass the Senate bill without requiring another vote relies on a straightforward understanding of the Constitution rather than obscure parliamentary procedures. Thus, it seems likely that the idea that reconciliation and/or the House passing the Senate's version of the bill could be used in the event of a Brown loss was already well understood by the time of the election. Consequently, the election itself probably did not provide new information on this point, especially to industry analysts and others most interested in the healthcare sector.

News stories immediately after the election show an awareness of the existence of these other roads to passing Health Reform and support the view that Brown's election reduced the likelihood of Health Reform's passage. According to the Washington Post on the day after the election:

Unless Democrats can thread a very narrow legislative needle, Republican Scott Brown's upset victory over Martha Coakley in Massachusetts on Tuesday could lead to the collapse of a health-care bill that, only weeks ago, appeared close to becoming law. ... The Democratic leaders reconvened briefly after Coakley conceded, and with Brown's win, lawmakers said, they will spend the coming days considering an array of long-shot scenarios, each with serious downsides.⁴³

The article went on to note the possibilities of the House passing the Senate bill and/or using the reconciliation procedure. *The New York Times* ran a similar story, noting that "Scott Brown's decisive Senate victory in Massachusetts imperiled the fate of the Democratic health care overhaul in Tuesday as House Democrats indicated they would not quickly approve a Senate-passed health care measure and send it to President Obama."⁴⁴ Thus, news reports from immediately after the election support the idea that Brown's election reduced the likelihood of Health Reform passing and that alternate means of passing the legislation, while known, were not yet being discussed as likely to be implemented.

A second approach to the question of whether Brown's election increased or decreased the likelihood of passing Health Reform relies on the fact that while the impact of the bill on some sub-sectors, in particular on health insurers and pharmaceutical companies, was

⁴² See <http://in.reuters.com/article/2009/03/14/usa-congress-healthcare-idINN1338614720090314> and http://www.boston.com/bostonglobe/editorial_opinion/editorials/articles/2009/03/15/next_stop_health_reform/.

⁴³ "For health-care reform, picture gets much more complicated," *The Washington Post*, January 20, 2010, p. A01.

⁴⁴ "Democrats Won't Rush To Pass Senate Bill," *The New York Times*, January 20, 2010, p. A13.

ambiguous, its impact on other sub-sectors was not. As discussed above, if Brown's election decreased the likelihood of Health Reform passing, we expect Brown's election to have a negative impact on the Facilities (hospitals) subsector and a positive effect on the Equipment (devices) subsector. The results in Table 1 confirm these expectations.⁴⁵ Similarly, if Brown's election decreased the likelihood of Health Reform passing, we expect that Brown's election would be better for firms with significant Medicare Advantage involvement and worse for firms with significant Medicaid involvement. Tables 3 and 4 confirm these expectations. Thus, in all cases, the results of the analysis for these unambiguous cases supports the view that Brown's election did, indeed, decrease the likelihood of Health Reform's passage.

A next question that arises with respect to the interpretation of our results is whether, as we have assumed, the principle impact of Scott Brown's election was to reduce the likelihood of Health Reform being enacted into law, or whether the election also impacted beliefs about the *nature* of the bill that would be enacted. If the latter were important, this could affect the interpretation of our results. For example, suppose that the election did not affect the likelihood of a bill being enacted at all, but rather resulted in markets believing that a much more pro-business bill would be enacted. In this case, the positive abnormal returns to health care stocks that we observe would result from the change in the nature of the bill. Consequently, it would not tell us anything about whether the parts of the bill that remained unchanged by the election (which were by far the majority) were good or bad for healthcare stocks.

Although this is theoretically plausible, we begin by noting that a general pro-business shift in policy would be unable to account for the negative impacts we find on the facilities subsector and on firms' participation in Medicaid Managed Care.⁴⁶ More broadly, however, it is unlikely that the election caused a major change in perceptions about the nature of the bill that would eventually be passed. While the House passing the Senate's version of the bill or use of the reconciliation process, which allowed only limited changes to be made to the Senate's bill, would result in final legislation that closely resembled the Senate's proposal, at the time of the

⁴⁵ Focusing more closely on hospitals, hospital firms in the SPISP (as defined by NAICS-code classification, including Community Health Systems, Tenet Healthcare, Universal Health Services, Health Management Association, LifePoint Hospitals, and Kindred Healthcare) experienced an average CAR of negative 6.5 percent, with individual firms' CARs ranging between negative 0.5 (Kindred Healthcare, which is primarily operates nursing homes rather than acute care hospitals) and negative 9.9 percent (Community Health Systems).

⁴⁶ The finding that the election had a negative impact on some subgroups also casts doubt upon another, similar criticism, which argues that the positive abnormal return associated with the election was simply due to a reduction in uncertainty about future regulation.

election it was already widely expected that the House-Senate compromise would lean heavily toward the Senate's version.

The reason for this begins with the tenuous nature of the deal in the Senate that resulted in a bill that could be passed by a 60 vote majority in the first place. Throughout the fall, Senate Democrats struggled to enlist Republican support for Health Reform, focusing on Senators Susan Collins and Olympia Snowe of Maine. However, these efforts were unsuccessful, and by the middle of December 2009 it had become apparent that the bill would have to be passed without Republican support. At the same time, the Senate Democratic leadership had to struggle just to secure the support of its 60-member caucus, and in doing so was forced to make major changes to the bill. In particular, in order to gain Independent Joseph Lieberman's (CT) vote, the Democrats were forced to drop the so-called "public option," an insurance plan that would be provided by the government.⁴⁷ Because of the fragility of the coalition in the Senate, it was clear that any House-Senate compromise bill that would be able to gain 60 votes in the Senate would have to look a lot more like the Senate's bill than the House's. For example, while the House bill did include a public option, it was clear that no such provision could pass in the Senate.⁴⁸ According to Lieberman, "There is a natural tendency to split the difference between the Senate and the House, [but on the health reform bills] splitting the difference means you won't have 60 votes in the Senate."⁴⁹ *The Christian Science Monitor* summarized the point, saying "Given the Senate's tenuous 60-vote coalition in favor of the bill, it's likely that the House will have to give up more in the final agreement than the Senate will."⁵⁰

Another factor pointing toward a compromise bill that more closely resembled the Senate bill than the House's is that the House's bill, estimated to cost more than \$1 trillion during the legislation's first 10 years, already cost more than the \$900 million limit that President Obama had set on the cost of Health Reform, while the Senate bill was estimated to cost only \$871 billion. According to Drew Altman, president of the Kaiser Family Foundation, "The tension is,

⁴⁷ http://voices.washingtonpost.com/capitol-briefing/2009/12/prospects_for_gop_support_of_s.html

⁴⁸ <http://www.cnsnews.com/node/56948>; <http://www.reuters.com/article/2009/12/24/us-usa-healthcare-comparison-idUKTRE5BM46Y20091224>; http://www.kff.org/healthreform/upload/housesenatebill_final.pdf

⁴⁹ "Democrats Face New Challenges in Merging Bills," *The New York Times*, Dec. 22, 2009, p. A1.

⁵⁰ "Obama takes hands-on role in advancing healthcare reform," by Peter Grier, *The Christian Science Monitor*, January 6, 2010.

the more you move toward the House bill, the more you have to pay for that. There isn't a lot of wiggle room financially, and there isn't a lot of wiggle room politically in any of this."⁵¹

Beyond the public option, the bills also differed on several other dimensions, including how to raise revenue to pay for coverage expansions, federal funding of abortions, the level of subsidies to help poor people purchase insurance and the penalties imposed on people who do not. The major issue on the revenue side was whether the Senate's "Cadillac tax" on high-cost health plans would be included in the final legislation. Although this tax, by putting pressure on employers to reduce the cost of their health insurance offerings, might be expected to affect the profitability of insurers and other healthcare firms, the White House strongly supported the tax, and by late December it had already become clear that any final legislation was likely to contain some version of the Cadillac tax.⁵² In the case of abortion, while this was certainly a contentious issue, it seems unlikely that changes in expectations about how Health Reform treats federal funding of abortions (which was already prohibited in separate legislation) would affect healthcare firms' stock prices. Finally, while the bills differed on the size of subsidies for low-income households and penalties for those who did not purchase insurance, both bills contained some version of both, and the financial and political considerations discussed above suggest that even before the election the expectation was that these provisions would more closely resemble the Senate's proposal than the House's.

Overall, while the House bill was somewhat more ambitious in terms of coverage expansion than the Senate bill, with the House's version reducing the projected number of uninsured in 2019 by 37 million people and the Senate's version reducing it by 31 million, both versions of Health Reform were expected to reduce the uninsured by over 30 million people.⁵³ Thus, while Brown's election probably moved the expected compromise bill coming from one that looked a lot like the Senate bill to almost exactly the Senate's bill, this change seems small relative to the difference between having either of the two bills and having no bill at all.⁵⁴ Nevertheless, we are unable to completely rule out the possibility that some of the abnormal

⁵¹ "Senate and House now must find magic pill; In search of compromise to placate liberals without driving off conservatives." *The Washington Post*, December 24, 2009, p. A01.

⁵² Ibid.

⁵³ <http://www.washingtonpost.com/wp-srv/special/nation/health/compare-health-plans-2009/>

⁵⁴ In addition, a number of the provisions where the two bills differ, such as federal funding for abortion services, were dimensions that seem unlikely to have a major impact on healthcare equities.

return to healthcare stocks observed during the event period was due to changes in the nature of the bill, rather than changes in the likelihood of its passage.

Next, we turn to the question of whether Scott Brown's election might have affected other policies that also affected healthcare stocks. While Scott Brown's election came in the middle of the healthcare debate and he had explicitly vowed during the campaign to block the legislation, Brown also broke the Democrats' 60-vote filibuster-proof majority more generally, which could be expected to affect other legislation pending before the Senate and move legislative outcomes in the near future in a more Republican-friendly direction. For example, other major legislative efforts under discussion at the time included changes in the taxation of dividends, labor reform, and financial sector reform. While our three-factor model controls for market-level risk factors, if the healthcare sector systematically differs from the rest of the market in terms of its exposure to these other policy changes, then the abnormal return we measure in our event study might be attributable to these other policies rather than health care reform.

We begin with the issue of dividend taxation. At the time of the Brown-Coakley election, current law had the Bush-era tax cuts expiring at the end of 2010. Thus, without additional legislation, individual and corporate tax rates would increase starting in 2011. Among these rate increases was an increase in the tax rate on dividends, which was at that time taxed at a reduced rate of 15 percent but would be taxed as ordinary income, with a top marginal rate of 39.6 percent, after the expiration of the tax cuts. A number of previous studies have documented that firms do, in fact, respond to changes in dividend taxation (Brown, Liang and Weisbenner, 2007; Chetty and Saez, 2006; Chetty and Saez, 2010). This raises a reasonable question of whether and/or to what extent the observed effect of Scott Brown's election on healthcare stocks was due to perceived changes in the likelihood of dividend taxation rather than changes in the likelihood or nature of Health Reform.

A second policy under discussion at the time of the Brown-Coakley election was labor reform. The "Employee Free Choice Act" (EFCA) was a piece of pro-labor legislation intended to make it easier for employees to unionize and provided harsher penalties against employers who try to punish workers for union involvement. Thus we might expect EFCA to have a particularly strong effect on firms and industries with low unionization rates. Among the provisions included in early versions of the bill was "card check," which would make it easier

for employees to unionize by allowing a union to form whenever signatures of more than 50 percent of eligible employees indicating their support have been secured, without requiring that an additional election be held. Although EFCA had been watered down throughout the fall of 2009 (including the removal of the card-check provision), it was recognized that Brown's election likely ended the possibility of its passage. Hence we should also consider whether some of the observed effect on healthcare stocks might have been driven by changes in the perceived likelihood of labor reform.

A final major policy initiative under discussion at the time of the Brown-Coakley election was financial sector reform. At the time of the election, the House had already passed the Wall Street Reform and Consumer Protection act of 2009, colloquially referred to as the "Dodd-Frank" bill, and the bill was being actively discussed in the Senate. This bill imposed additional regulations on the financial sector. Although it did not directly regulate healthcare firms, to the extent that firms must interact with the financial sector (e.g., banks) for financing, Dodd-Frank might have affected healthcare firms.

Ultimately, we will address concerns over these alternative policies by attempting to control for firms' exposure to them in our regressions. However, before doing that it is important to note one crucial difference between Health Reform and these other policies, and that is that while Scott Brown was explicitly the marginal vote needed to pass health reform, the potential for Brown to make a major impact in the other cases was not as clear. On labor reform, while at the start of 2010 there was still some chance of a labor reform bill being passed, the card check provision was jettisoned in the fall of 2009 after it became clear that there were not 60 Senate votes in favor of a bill with card check in it, and serious doubts remained about whether there were 60 votes in support of *any* version of the labor bill. Hence it is unlikely that Scott Brown was the critical swing vote on labor reform, although Brown's election may have been the final nail in the legislation's coffin.⁵⁵ In the case of dividend tax reform, current law, which was favored by Democrats, had the dividend tax rate increasing at the end of 2010. Since Brown presumably favored lower dividend tax rates, he represented a 41st vote on the Republican side of the issue, far short of the 60 votes that would be needed to change current law and extend the dividend tax cut. Finally, in the case of the Dodd-Frank financial-sector reform bill, Brown's position was far more moderate, and in the end he was one of three Republican Senators who

⁵⁵ <http://www.nytimes.com/2009/09/05/business/05labor.html>

voted in favor of Dodd-Frank, although he did likely affect the final bill by gaining concessions for Massachusetts-based mutual fund companies in exchange for his support.

We control for exposure to labor reform and dividend tax reform by including unionization rates and dividend rates as controls in our event study regressions. The dividend data come from the CRSP database and include, for each firm, its 2009 dividend rate. Union membership data is based on the Current Population Survey as compiled in the Union Membership and Coverage Database from the CPS and include 2009 union membership rates for each firm based on its classification into one of 263 different CPS Industry Classification Codes.⁵⁶

Exposure to financial sector reform is somewhat more complicated, as it is less obvious what cross-sectional variables might proxy for exposure to changes in financial-sector regulations. To address this, we re-run the three factor Fama-French model including as a fourth factor the return on a portfolio of financial-sector stocks minus the risk free rate of return according to equation (5):

$$R_{it} - R_{ft} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + \beta_{si} \cdot SMB_t + \beta_{hi} \cdot HML_t + \beta_{FINi} (R_{FINt} - R_{ft}) + \varepsilon_{it} \quad \text{Eq. (5)}$$

where R_{FINt} is the return on a portfolio of financial-sector stocks. The resulting coefficient on financial sector returns, β_{FINi} , captures the partial correlation between a firm's return and financial sector returns. We then use the firm-level "financial-sector beta" coefficients as independent variables in our regressions aimed at capturing the relationship between the firm's abnormal returns and exposure to the financial sector.⁵⁷

While controlling for the influence of these factors will help address the question of whether the impact of Scott Brown's election on healthcare stocks might have worked through channels other than Health Reform, it will obscure any effects of Health Reform that are correlated with the new control variables. For example, Health Reform included the "Cadillac tax" on high-cost health plans, and such plans are often found in the benefit packages for union employees. Thus, even if the entire impact of the election worked through changes in the likelihood of Health Reform, we would expect that some of the effect would be correlated at the firm (or sector) level with unionization rates. While we will not be able to separately identify

⁵⁶ The dataset is compiled by Barry Hirsh and David Macpherson and available at www.unionstats.com.

⁵⁷ Alternatively, we used the version of the Fama-French model including the performance of the financial-sector portfolio as a fourth factor to predict firms' abnormal returns *net* of exposure to the financial sector. Doing so has very little impact on the overall results.

effects that work through changes in the likelihood of labor reform and changes that work through changes in the likelihood of health reform but are correlated with unionization, to the extent that our results are robust to including unionization and other controls we can conclude that the effect of the election was not *solely* due to changes in the likelihood of labor reform or other policies.

Tables 5 and 5a replicate the analysis in Tables 1 and 1a adding controls for the firm's 2009 dividend payout rate, (sector-level) unionization rate, and exposure to the financial sector as measured by the firm's "financial beta." Results are similar when we also include the square of each of these control variables. Due to the fact that β_{FINi} might be expected to behave differently for financial-sector firms, we exclude them from the regressions. The results for the impact of the election on healthcare stocks do not change substantially if they are included, although the coefficients on β_{FINi} do change.

Tables 5 and 5a show that the main coefficients of interest change only slightly. We now find a 1.84 percent CAR to dollars invested in the healthcare sector, compared to 2.15 in the regressions without these controls. The returns to dollars invested in Managed Care, Equipment, Facilities and Pharmaceuticals remain statistically significant, with the magnitudes decreasing slightly.

Taking a closer look at the new controls, we find that unionization is significantly and negatively related to firms' CARs during the event window. As discussed above, this could be due to Brown's election leading the market to believe that labor reform was less likely to pass. Since one of the aims of labor reform was to make it easier for firms to unionize, we would expect the benefit of this to be felt most strongly by firms in industries with low unionization rates. Overall, healthcare firms had a mean unionization rate of 3.9 percent, slightly less than the overall rate of 6.7 percent, although as one might expect the hospital sector had a higher unionization rate of 8.8 percent. Thus, roughly speaking, the healthcare sector's lower unionization rate accounts for less than one tenth of one percentage point of the observed abnormal return to healthcare stocks compared to the market overall.

The coefficient on firms' lagged dividend rate is insignificant in all specifications.

The coefficient on financial-betas are positive and significant in most specifications. However, the qualitative impact of financial-sector dependence is small, once again accounting

for less than one tenth of one percentage point of the difference between returns to healthcare stocks and returns to the market overall.

VII. Conclusion

This paper demonstrates a strong link between Scott Brown's victory and positive abnormal returns for firms in the healthcare sector, and in the health insurance and pharmaceutical sub-sectors in particular. Given that Brown campaigned explicitly to defeat Health Reform and by virtue of being the 41st Republican vote had the power to do so, we have interpreted the evidence as saying that markets expected the reform effort to be harmful to healthcare firms overall and to insurers, pharmaceutical firms and medical device manufacturers in particular, but beneficial to hospitals.

While this interpretation is natural, Scott Brown's election did more to the Congressional landscape than merely defeat health reform. Thus, it raises the possibility that the abnormal returns we detected were not a result of Brown's opposition to health reform, but to some other contemporaneous change. However, our robustness checks are able to rule out changes in other policies such as labor reform, dividend tax policy, or financial sector reform as playing a major role in the abnormal returns we observed.

A more subtle version of this critique is to note that not only did Brown's election deal a severe blow to Health Reform, it also might have signaled that additional regulations aimed at the health care sector would become less likely in the future. Since the health sector is regulated more intensively than typical industries, this could result in an abnormal, positive return to health care stocks. Thus the abnormal returns we detected using the event study would contain the effects of provisions explicitly in Health Reform as well as other healthcare sector reforms that might be coming further down the line. Although our analysis is unable to separately identify these effects, it seems unlikely that the Health Reform was believed to be a good thing for insurers but the effect on anticipated future regulations was so strong as to overwhelm this effect and generate a positive abnormal return following Brown's election. Further, if we interpret the Health Reform as containing not only the original legislation but also the additional regulations that would follow from it in the future, then both of these types of effects would be included in the broader definition of Health Reform.

Rather than test a hypothesis about the impact of an election or policy change on equities, this paper uses the efficiency of markets and the impact of Brown's surprise victory to judge which of the competing claims regarding the impact of health reform on the insurance industry, and on the health care industry more broadly, is supported by the market. If markets efficiently incorporate information on expectations about future performance, the results suggest that the markets side with Republicans, and that Health Reform was expected to harm the insurance industry. However, it should be pointed out that the positive abnormal returns associated with Brown's election do not necessarily invalidate the claims from the left that the bills were too generous to insurance companies, since it is likely that the two sides were referring to different counterfactuals in their statements. In particular, many liberal activists believe strongly that the right health care system is a single payer system such as the Canadian system or else a "Medicare-for-all" type system. Relative to this benchmark, the current bills were certainly more generous to insurance companies than a single-payer system was likely to be. Thus, while the expected defeat of health reform may have been good for insurers relative to the market's expectations before Brown's election, health reform might still have been better for insurers than liberals might have wanted.

A related issue arises in the interpretation of our finding that Health Reform was expected to harm pharmaceutical firms. During the summer of 2009, the country's major pharmaceutical firms entered into a much-publicized agreement whereby they would support Health Reform and contribute \$80 billion over a decade to reduce the cost of prescription drugs for senior citizens, particularly for those in the Medicare Part D "doughnut hole" between \$2,000 and \$6,154 per year who are expected to pay the full cost of their drugs. Thus it might appear from our results showing that Health Reform harmed drug companies that drug companies made a bad deal. However, this interpretation is complicated by the changing landscape of health reform. At the time the drug companies entered into the deal, they were faced with the threat of even stronger action and the possibility, for example, that Medicare would take a direct role in negotiating drug prices. Relative to that, the drug companies' decision to strike a deal made sense. On the other hand, by the time of the Brown election it was clear that if Health Reform failed, it was unlikely to be replaced by another significant piece of legislation in the near future. Thus, following Brown's election, drug companies and their owners were expecting to get out of paying \$80 billion over the next decade and return to a world without significant additional regulation. Seen

in this light, it is not surprising that we observe pharmaceutical firms benefitting from Brown's election.

While we have focused on using equity markets to shed light on whether Health Reform was expected to benefit or harm the healthcare sector, this study also contributes to the literature on the link between political events and stock market returns. We find that not only did stock markets react to Brown's election, but they did so in a rather nuanced way, with the impact varying by subsector (e.g., facilities vs. equipment) and by involvement in particular government programs (e.g., Medicare Advantage vs. Medicaid Managed Care). Thus the findings of this paper extend the existing literature on the connection between political events and equity markets by showing that markets are able to differentiate among firms even within a particular sector (e.g., healthcare) and even among individual insurance firms that differ in their exposure to government programs.

Although we detected a significant, positive effect on health care stocks following Brown's election, within days this effect had eroded somewhat. This rebound likely due to several factors. First, in the days immediately after the election it became apparent that Brown's election would not end Democrats' efforts to pass Health Reform, which may have led markets to incorporate an increased belief in the likelihood of its passage. During a Town Meeting event in Ohio on January 22, President Obama declared "I'm going to keep up the fight for real, meaningful health insurance reforms. That's why we expanded the children's health insurance program to include four million more kids. And that's why I'll continue fighting for reform that will hold the insurance industry accountable and bring more stability and security to folks in our health care system."⁵⁸ At the same time, although in the immediate aftermath of the election Democratic leaders publicly discounted the possibility of passing Health Reform by having the House pass the Senate bill or using the reconciliation process, within a few days they began to seriously consider these approaches.⁵⁹

Although the short-term gains in health care stocks did not persist, the losses, coming as responses to additional information being integrated into markets in the days following the

⁵⁸ <http://voices.washingtonpost.com/44/2010/01/obamas-jobs-speech-in-ohio-the.html>

⁵⁹ In addition, in the days that followed the election, markets may have come to adjust their beliefs about the degree of regulatory uncertainty in the health sector. According to one analyst, "I think [the drop in stock prices is] because the market doesn't like uncertainty. Given the Massachusetts election, the market doesn't know what to do." (see <http://www.marketwatch.com/story/story/print?guid=06A8328B-57CD-4026-B2CE-EE8547CF35AA>) Finally, there was negative information about the industry coming out that was unrelated to the election, with Oppenheimer cutting CIGNA from "overperform" to "perform" on January 26, 2010.

election, are fully consistent with our results. While Brown's election signaled a decrease in the likelihood of Health Reform passing and led to positive abnormal returns, Obama's speech and the Democrats new strategies both increased its likelihood and, consistent with our findings, led to losses.

Finally, it is important to note that the focus of this paper has been on equity-price responses to changes in the likelihood of Health Reform. To the extent that changes in equity-prices capture changes in producer surplus, the analysis in this paper provides an early view of part of the impact of Health Reform on overall welfare.⁶⁰ Although Health Reform may be expected to reduce producer surplus, it has the potential to increase consumer welfare through expanding coverage, increasing quality and lowering cost in the long run. However, since the provisions of the bill will only be phased in over the next several years, it may be a decade or more before this impact can be measured and an overall welfare assessment can be developed. Nevertheless, our findings of significant but moderate effects of Health Reform on the healthcare industry suggest that overall expectations of Health Reform are that it is not bring about catastrophic consequences such as ending private insurance, driving hospitals out of business or crushing pharmaceutical innovation.

⁶⁰ However, it must also be recognized that publicly-traded firms are only a part of the overall industry. A full welfare analysis would also need to take into account other for-profit firms, non-profit firms, and government providers.

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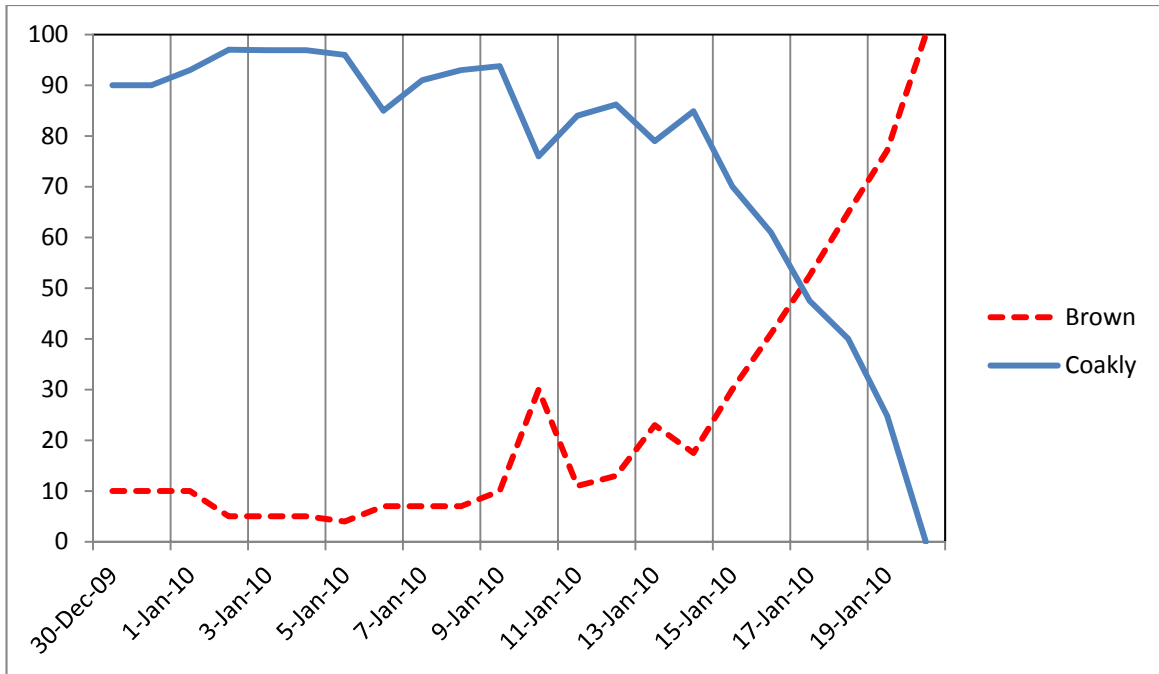


Figure 1: Intrade.com daily closing prices for the “Brown Victory” and “Coakley Victory” contracts, which paid \$100 if the appropriate candidate won.

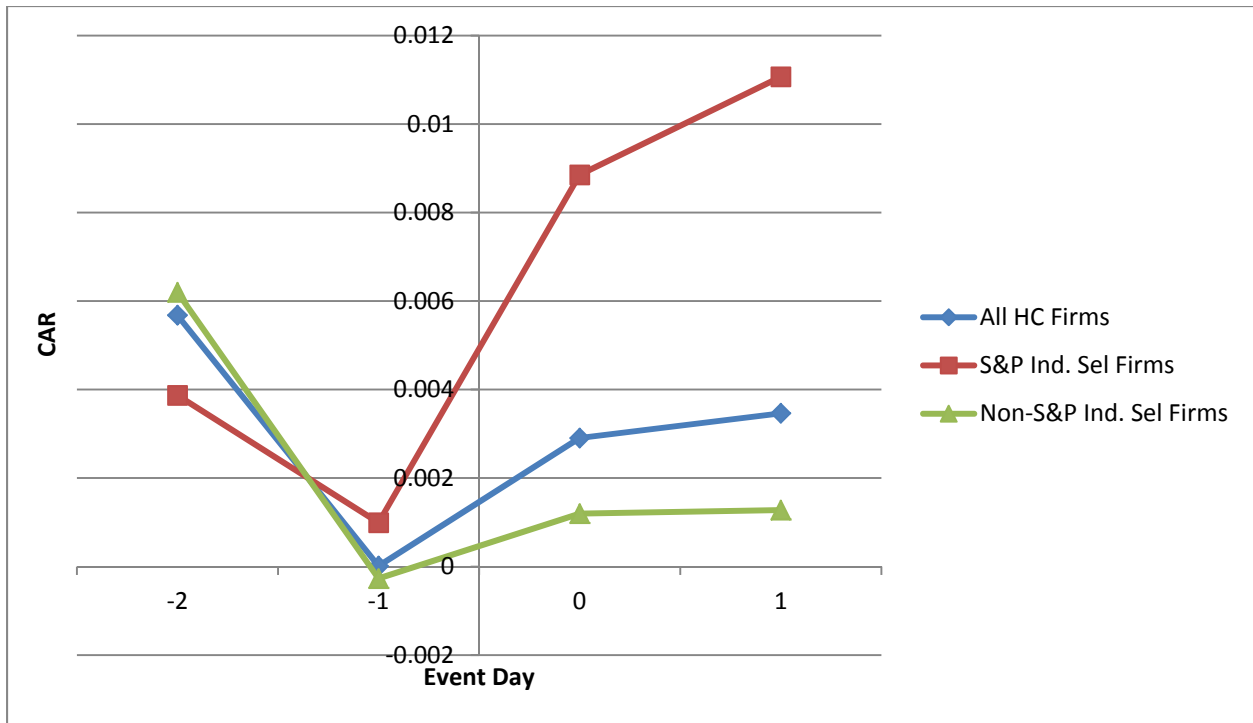


Figure 2: Cumulative abnormal return (equally weighted) by event day for All Healthcare Firms, Healthcare firms in the SPISP, and Healthcare firms not in the SPISP.

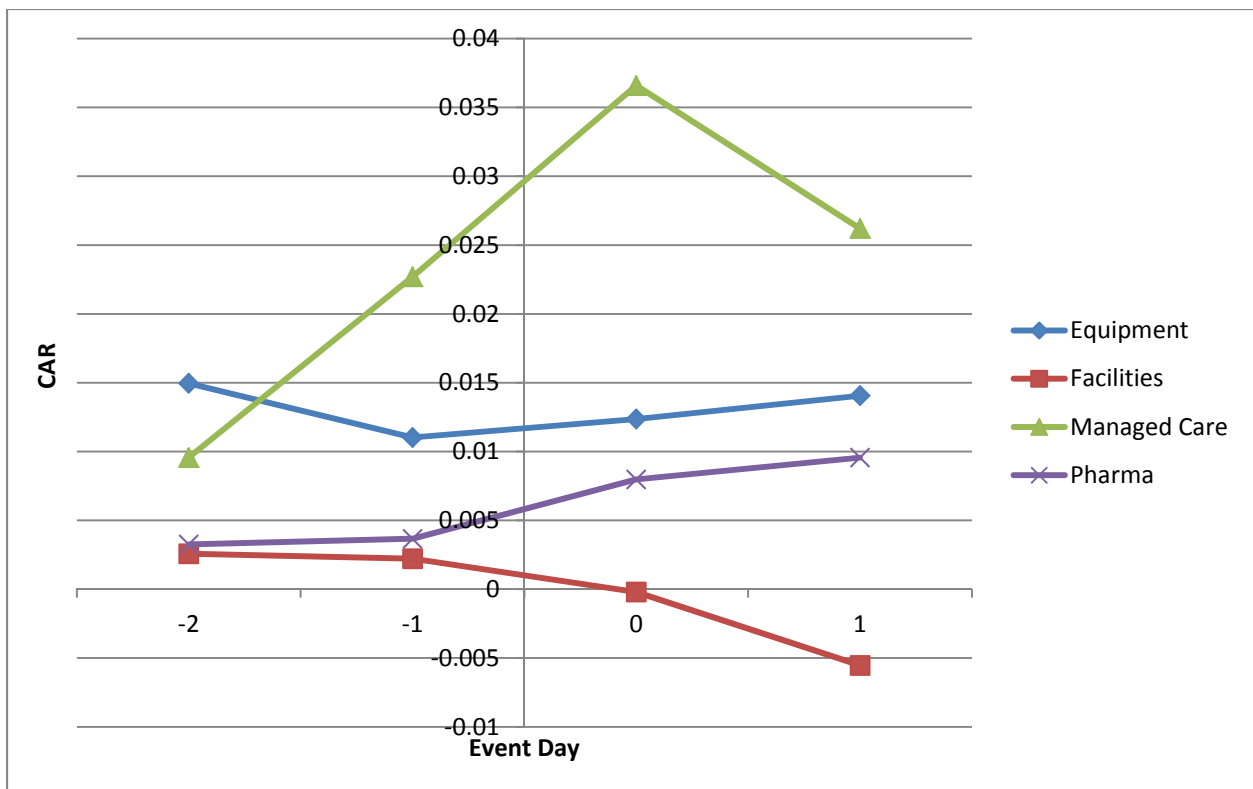


Figure 3: Cumulative abnormal return (equally weighted) by event day for firms in the SPISP Equipment, Facilities, Managed Care and Pharmaceuticals subsectors.

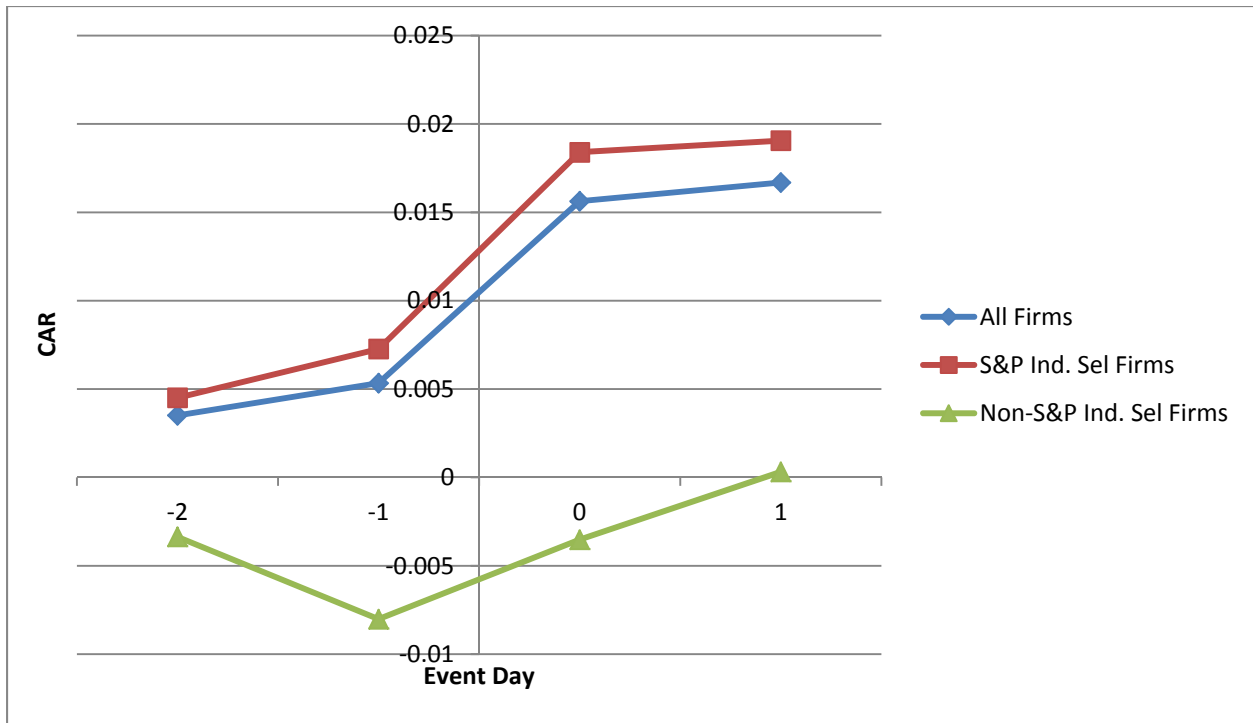


Figure 4: Cumulative abnormal return (weighted by market capitalization) by event day for All Healthcare Firms, Healthcare firms in the SPISP, and Healthcare firms not in the SPISP.

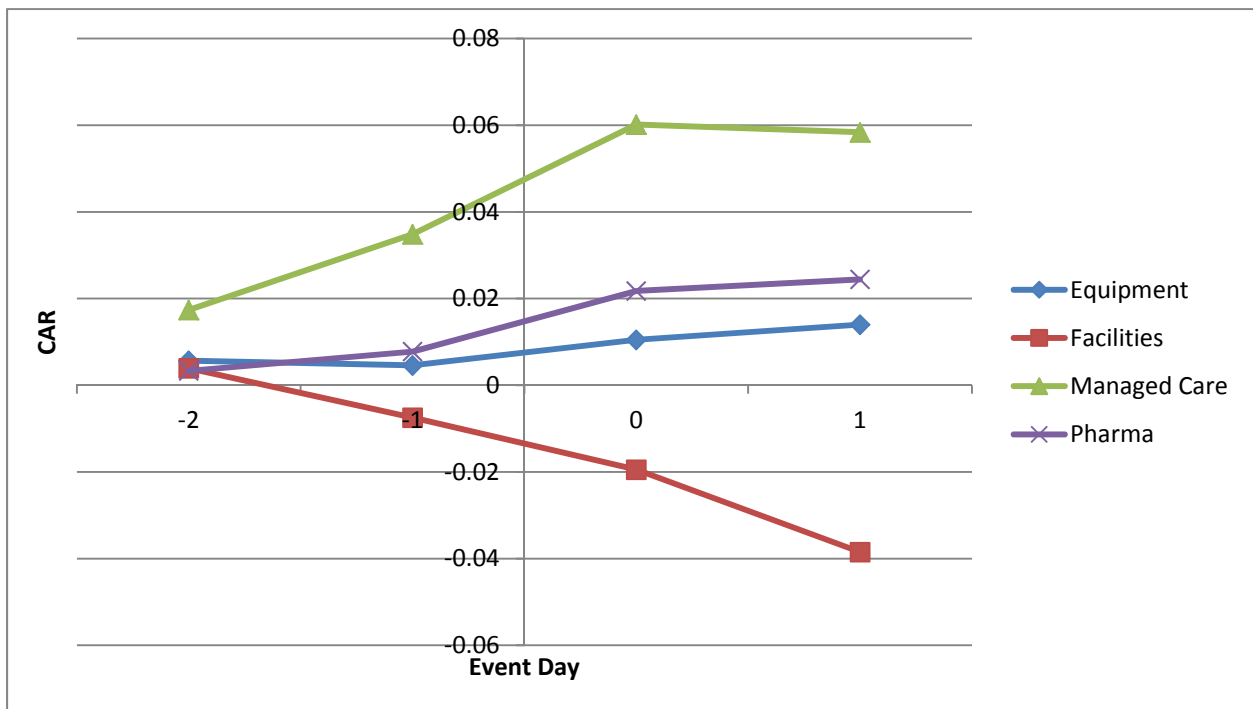


Figure 5: Cumulative abnormal return (weighted by market capitalization) by event day for firms in the SPISP Equipment, Facilities, Managed Care and Pharmaceuticals subsectors. Election Day is day 0.

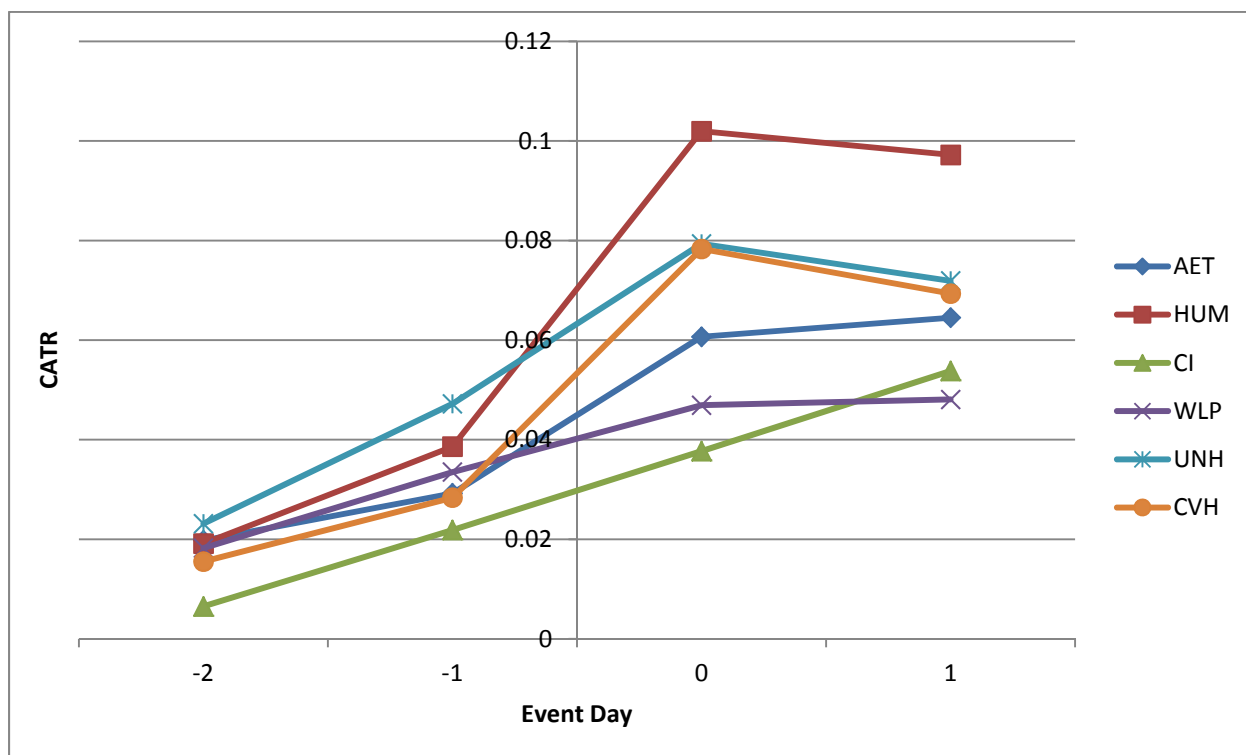


Figure 6: Cumulative abnormal return by event day for major managed care firms Aetna (AET), Humana (HUM), Cigna (CI), Wellpoint (WLP), United Healthcare (UNH) and Coventry (CVH). Election Day is day 0.

Table 1: Main Results

VARIABLES	Equally Weighted Regressions			Value Weighted Regressions		
	(1) CAR	(2) CAR	(3) CAR	(4) CAR	(5) CAR	(6) CAR
Healthcare	0.0057* (0.0031)			0.0215*** (0.0041)		
Healthcare, SPISP		0.0133*** (0.0041)			0.0238*** (0.0044)	
Healthcare, not SPISP		0.0035 (0.0038)			0.0051 (0.0063)	
Healthcare Subsectors	Managed Care		0.0285** (0.0127)			0.0632*** (0.0065)
	Pharmaceuticals		0.0118 (0.0095)			0.0292*** (0.0079)
	Facilities		-0.0033 (0.0091)			-0.0337*** (0.0121)
	Equipment		0.0163*** (0.0058)			0.0188*** (0.0036)
	Distributors		0.0057 (0.0096)			0.0129* (0.0066)
	Supplies		0.0084 (0.0076)			0.0077** (0.0035)
	Services		0.0090 (0.0070)			0.0033 (0.0053)
	Technology		0.0227 (0.0240)			-0.0057 (0.0045)
	Biotechnology		-0.0080 (0.0061)			0.0159*** (0.0040)
	Life Sci. Tools & Serv.		0.0058 (0.0109)			-0.0133 (0.0099)
Financial Sector	0.0285*** (0.0047)	0.0285*** (0.0047)	0.0285*** (0.0047)	0.0122*** (0.0035)	0.0122*** (0.0035)	0.0122*** (0.0035)
Constant	-0.0023* (0.0012)	-0.0023* (0.0012)	-0.0023* (0.0012)	-0.0048*** (0.0013)	-0.0048*** (0.0013)	-0.0048*** (0.0013)
Observations	3,674	3,674	3,674	3,674	3,674	3,674
R-squared	0.0204	0.0208	0.0228	0.0817	0.0881	0.1327

Note: Columns 1 – 3 each report estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 4 – 6 each report estimates from OLS regressions weighted by the firms' market capitalization. Healthcare is an indicator variable for firms classified in two-digit GICS code 35, "Healthcare". Healthcare SPISP and Healthcare non-SPISP are indicator variables that further divide firms in to whether or not they are constituents of one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled "Healthcare Subsectors" further divide all healthcare firms into subsectors based on seven digit GICS codes. Financial Sector is an indicator variable for whether the firm is in the financial sector. Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1.

Table 1a: Main Results (continued)

VARIABLES		(1) Equally Weighted CAR	(2) Value Weighted CAR
SPISP	Managed Care	0.0701*** (0.0064)	0.0693*** (0.0061)
	Pharmaceuticals	0.0330*** (0.0077)	0.0300*** (0.0082)
	Facilities	-0.0313** (0.0151)	-0.0451*** (0.0152)
	Equipment	0.0192*** (0.0045)	0.0162*** (0.0034)
	Distributors	0.0071 (0.0070)	0.0141** (0.0072)
	Supplies	0.0097** (0.0045)	0.0091** (0.0037)
	Services	0.0045 (0.0173)	0.0014 (0.0055)
	Biotechnology	0.0050 (0.0080)	0.0168*** (0.0042)
	Life Sci. Tools & Serv.	-0.0053 (0.0059)	0.0031 (0.0069)
Non-SPISP	Managed Care	0.0058 (0.0155)	0.0075 (0.0168)
	Pharmaceuticals	0.0017 (0.0133)	-0.0011 (0.0133)
	Facilities	0.0089 (0.0102)	-0.0059 (0.0084)
	Equipment	0.0155** (0.0072)	0.0309*** (0.0048)
	Distributors	0.0048 (0.0149)	0.0018 (0.0068)
	Supplies	0.0079 (0.0105)	0.0021 (0.0089)
	Services	0.0108 (0.0070)	0.0199*** (0.0071)
	Technology	0.0227 (0.0240)	-0.0057 (0.0045)
	Biotechnology	-0.0106 (0.0071)	0.0102 (0.0092)
	Life Sci. Tools & Serv.	0.0069 (0.0120)	-0.0270*** (0.0097)
	Financial Sector	0.0285*** (0.0047)	0.0122*** (0.0035)
	Constant	-0.0023* (0.0012)	-0.0048*** (0.0013)
Observations		3,674	3,674
R-squared		0.0248	0.1428

Note: Columns 1 reports estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 2 reports estimates from OLS regressions weighted by the firms' market capitalization. The variables labeled "SPISP" are indicator variables that divide all healthcare firms into subsectors based on seven digit GICS codes and whether they are in one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled Non-SPISP are indicator variables that divide firms based on subsector for firms that are not in one of the SPISP portfolios. Financial Sector is an indicator variable for whether the firm is in the financial sector. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 2: Individual Managed-Care Firms

Firm	CAR	p-value
Aetna	0.0645	0.021
Cigna	0.0558	0.028
Coventry Health	0.0693	0.018
Humana	0.0972	0.005
United Healthcare	0.0718	0.017
Wellpoint	0.0481	0.041

Note: This table gives the CAR over the event window for each of the six Managed Care firms that are also in one of the S&P Industry Select healthcare portfolios. The p-value is the probability that a CAR drawn from the distribution of CARs for all non-healthcare, non-financial, S&P 500 firms is greater than or equal to the firm's CAR.

Table 3: Impact of Government Programs

VARIABLES	(1) CAR	(2) CAR
Medicare Advantage	0.0505*** (0.00836)	0.0587*** (0.0129)
Medicaid Managed Care	-0.0664** (0.0299)	-0.0532 (0.0351)
Medicaid		-0.0160 (0.0198)
Financial Sector	0.0276*** (0.00467)	0.0275*** (0.00467)
Constant	-0.00133 (0.00110)	-0.00129 (0.00110)
Observations	3,664	3,664
R-squared	0.021	0.021

Note: Columns 1 and 2 report estimates for equally weighted regressions of the firms' CAR on the variables listed in the rows. "Medicare Advantage," "Medicare" and "Medicare Managed Care" are indicator variables for whether the firm description on google finance contains each of these terms. Financial Sector is an indicator for whether the firm is in the financial sector. Robust standard errors in parentheses. For column 2, the test of H_0 : Medicaid Managed Care + Medicaid = 0; $F(1,3669) = 4.84$, Prob > F = 0.0279; *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Impact of Government Program Membership and Revenue

	(1)	(2)	(3)	(4)
VARIABLES	CAR	CAR	CAR	CAR
MA Members	5.27e-05*** (1.39e-05)	5.34e-05** (1.71e-05)		
Medicaid Members	-5.04e-05*** (1.21e-05)	-5.08e-05*** (1.43e-05)		
Comm. Members	3.25e-06** (1.26e-06)	3.37e-06** (1.47e-06)		
MA Revenue			4.60e-06*** (1.18e-06)	4.13e-06** (1.33e-06)
Medicaid Revenue			-2.28e-05*** (5.62e-06)	-2.26e-05*** (6.07e-06)
Comm. Revenue			8.39e-07 (6.13e-07)	2.56e-07 (7.98e-07)
SPISP		-2.396e-03 (0.0231)		1.280e-02 (0.0164)
Constant	4.323e-02*** (0.00911)	4.381e-02*** (0.0114)	4.287e-02*** (0.0123)	4.245e-02** (0.0133)
Observations	15	15	14	14
R-squared	0.725	0.725	0.766	0.770

Note: Columns 1 and 2 report the results of regressions of each firm's CAR on the number of members in its Medicare Advantage (MA), Medicaid, and Commercial segments (measured in thousands). SPIS is an indicator variable for whether the firm is in one of the S&P Industry Select Portfolios. Columns 3 and 4 report the results of regressions of each firm's CAR on the revenue earned in its Medicare Advantage (MA), Medicaid, and Commercial segments (measured in millions of dollars). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Robustness

VARIABLES	Equally Weighted Regressions			Value Weighted Regressions		
	(1) CAR	(2) CAR	(3) CAR	(4) CAR	(5) CAR	(6) CAR
Healthcare	0.00400 (0.00325)			0.0184*** (0.00397)		
Healthcare, SPISP		0.0112*** (0.00419)			0.0206*** (0.00433)	
Healthcare, not SPISP		0.00195 (0.00385)			0.00344 (0.00636)	
Healthcare Subsectors	Managed Care		0.0255** (0.0128)			0.0609*** (0.00627)
	Pharmaceuticals		0.00964 (0.00956)			0.0252*** (0.00777)
	Facilities		-0.00447 (0.00900)			-0.0332*** (0.0118)
	Equipment		0.0148** (0.00579)			0.0167*** (0.00384)
	Distributors		0.00487 (0.00990)			0.00640 (0.00469)
	Supplies		0.00634 (0.00778)			0.00554 (0.00356)
	Services		0.00792 (0.00707)			0.00191 (0.00556)
	Technology		0.0209 (0.0242)			-0.00823* (0.00462)
	Biotechnology		-0.00990 (0.00618)			0.0140*** (0.00417)
	Life Sci. Tools & Serv.		0.00410 (0.0109)			-0.0145 (0.0101)
	Dividend	-0.00399 (0.0466)	-0.00570 (0.0460)	-0.00857 (0.0453)	0.0760 (0.0500)	0.0661 (0.0487)
Unionization	-0.000159* (9.55e-05)	-0.000159* (9.54e-05)	-0.000158* (9.55e-05)	-0.000273*** (0.000102)	-0.000268*** (0.000102)	-0.000261** (0.000102)
Financial Beta	0.675** (0.270)	0.658** (0.270)	0.670** (0.270)	0.491* (0.262)	0.480* (0.262)	0.416 (0.261)
Constant	-9.11e-05 (0.00172)	-8.36e-05 (0.00172)	-5.48e-05 (0.00173)	-0.00274 (0.00174)	-0.00260 (0.00173)	-0.00266 (0.00173)
Observations	2,845	2,845	2,845	2,845	2,845	2,845
R-squared	0.005	0.005	0.011	0.102	0.108	0.160

Note: Columns 1 – 3 each report estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 4 – 6 each report estimates from OLS regressions weighted by the firms' market capitalization. Healthcare is an indicator variable for firms classified in two-digit GICS code 35, "Healthcare". Healthcare SPISP and Healthcare non-SPISP are indicator variables that further divide firms in to whether or not they are constituents of one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled "Healthcare Subsectors" further divide all healthcare firms into subsectors based on seven digit GICS codes. Dividend is the firm's 2009 dividend rate, Unionization is the 2009 proportion of the firm's workers who are union members (measures on a scale form 0 – 100), Financial Beta is the partial correlation between the firm's return and that of a portfolio of financial sector stocks. Financial Sector firms are not included in the regressions. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5a: Robustness

VARIABLES		(1) Equal Weighted CAR	(2) Value Weighted CAR
SPISP	Managed Care	0.0666*** (0.0064)	0.0669*** (0.0057)
	Pharmaceuticals	0.0310*** (0.0078)	0.0260*** (0.0080)
	Facilities	-0.0317** (0.0147)	-0.0441*** (0.0149)
	Equipment	0.0172*** (0.0045)	0.0140*** (0.0036)
	Distributors	0.0060 (0.0080)	0.0073 (0.0051)
	Supplies	0.0069 (0.0046)	0.0068* (0.0037)
	Services	0.0022 (0.0175)	-0.0001 (0.0057)
	Biotechnology	0.0020 (0.0081)	0.0148*** (0.0044)
	Life Sci. Tools & Serv.	-0.0056 (0.0058)	0.0024 (0.0067)
SPISP	Managed Care	0.0032 (0.0156)	0.0053 (0.0167)
	Pharmaceuticals	-0.0005 (0.0133)	-0.0020 (0.0129)
	Facilities	0.0074 (0.0102)	-0.0073 (0.0085)
	Equipment	0.0142* (0.0072)	0.0294*** (0.0049)
	Distributors	0.0043 (0.0152)	-0.0002 (0.0070)
	Supplies	0.0062 (0.0107)	0.0001 (0.0089)
	Services	0.0101 (0.0070)	0.0189*** (0.0072)
	Technology	0.0210 (0.0242)	-0.0083* (0.0046)
	Biotechnology	-0.0122* (0.0072)	0.0086 (0.0092)
	Life Sci. Tools & Serv.	0.0051 (0.0120)	-0.0286*** (0.0097)
Dividend		-0.0117 (0.0443)	0.0577 (0.0484)
Unionization		-0.0002 (0.0001)	-0.0003** (0.0001)
Financial Beta		0.6520** (0.2702)	0.4165 (0.2613)
Constant		-0.0001 (0.0017)	-0.0026 (0.0017)
Observations		2,845	2,845
R-squared		0.0154	0.1718

Note: Columns 1 reports estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 2 reports estimates from OLS regressions weighted by the firms' market capitalization. The variables labeled "SPISP" are indicator variables that divide all healthcare firms into subsectors based on seven digit GICS codes and whether they are in one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled Non-SPISP are indicator variables that divide firms based on subsector for firms that are not in one of the SPISP portfolios. Dividend is the firm's 2009 dividend rate, Unionization is the 2009 proportion of the firm's workers who are union members (measures on a scale from 0 – 100), Financial Beta is the partial correlation between the firm's return and that of a portfolio of financial sector stocks. Financial firms are not included in the regressions. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.